

California's Environmental Principles



The State of California's Environmental Principles and Concepts were approved in 2004 under a law referred to as the California Education and the Environment Initiative (EEI).

The law called for the development of Environmental Principles and Concepts that are compatible with the State's academic content standards and, as such, would become a formal part of California's K-12 education system. The EEI Curriculum, which this unit is part of, is designed to help students simultaneously achieve mastery of selected academic content standards and California's Environmental Principles and Concepts.

Principle I

People Depend on Natural Systems

The continuation and health of individual human lives
and of human communities and societies
depend on the health of the natural systems that provide essential goods
and ecosystem services.

Principle II

People Influence Natural Systems

The long-term functioning and health of terrestrial, freshwater, coastal and marine ecosystems
are influenced by their relationships with human societies.

Principle III

Natural Systems Change in Ways that People Benefit from and can Influence

Natural systems proceed through cycles
that humans depend upon, benefit from and can alter.

Principle IV

There are no Permanent or Impermeable Boundaries that Prevent Matter from Flowing between Systems

The exchange of matter between natural systems and human societies
affects the long-term functioning of both.

Principle V

Decisions Affecting Resources and Natural Systems are Complex and Involve Many Factors

Decisions affecting resources and natural systems
are based on a wide range of considerations
and decision-making processes.

DRAFT

for discussion purposes only

California Education and the Environment Initiative

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California Integrated Waste Management Board
California Department of Education
California State Board of Education
Office of the Secretary of Education
California Resources Agency**

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Overview

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In kindergarten, students come to know that Earth is made up of land, air, and water; more specifically, they learn the characteristics of mountains, rivers, oceans, valleys, and deserts—five ecosystems in California—and relate the landforms they see in their local environment to these five ecosystems. A unique feature of this unit is the extension of students’ thinking about these ecosystems

to develop understanding of how humans depend on the goods and services provided by ecosystems.

Lessons in the unit are sequenced around the flow of water from mountain streams and rivers, through the valleys, and into the ocean. Students also discover that water is found in ponds and lakes and in aquifers in the desert. Through these lessons, they learn that water is a common and

essential component of each ecosystem critical to humans. This understanding also helps students see that different ecosystems are connected in a larger system.

Making these connections among the ecosystems involves identifying connectors—such other components of ecosystems as animals, plants, and minerals—that help define these systems. Students encounter

At a Glance



E Is for Earth

Read *The World Around Me* and explore the Earth’s major ecosystems.



R Is for River

Discover where and how rivers flow in California.



M Is for Mountain

Investigate mountain ecosystems and what lives there.



California Content Standard

K.3. Earth is composed of land, air, and water.

K.3.a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.

several organisms from each of the ecosystems and discuss how they help connect the parts of the system. Concept mapping is used throughout the unit to illustrate the connections among the parts of each ecosystem, connections among the ecosystems themselves, and humans' dependence on the resources obtained from these ecosystems.

Individual lessons help students understand that goods produced by natural systems (water, food, materials for shelter, and so on) are essential to human life and to the functioning of our economies and cultures. Students also learn that humans depend on the services provided by natural systems, including the flow of water through different ecosystems. While the relationship between people and ecosystems is more complex than

California Environmental Principle I

The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services.

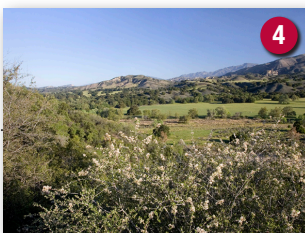
Concept A: Students need to know that the goods produced by natural systems are essential to human life and to the functioning of our economies and cultures.

Concept B: Students need to know that the ecosystem services provided by natural systems are essential to human life and to the functioning of our economies and cultures.

reliance on natural features, kindergarteners are cognitively ready for understanding many aspects of the human/environment relationship.

Lessons in this unit also support students' study of specific English-Language Arts (ELA) standards in the areas of reading, writing, use of language conventions, and listening and speaking. Activities supporting

these English-Language Arts standards include sharing of *The World Around Me* big book, developing individual student books, using letters and phonetically spelled words to complete the books and activities, and participating in oral discussions about objects and events that affect the students' daily lives, related to the ecosystems in California.



V Is for Valley

Identify a valley ecosystem and what resources it provides.



D Is for Desert

Investigate the challenges faced by desert plants and animals.



O Is for Ocean

Examine a California map and identify where rivers enter the Pacific Ocean.

Background



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Caption to come

Earth is composed of land, air, and water. These states of matter—the gases, liquid, and solids on Earth—have interacted and interrelated in a multitude of ways over eons to form the mountains, rivers, oceans, valleys, and deserts that comprise various parts of the world.

The organisms that inhabit those areas also play a part in defining the mountains, rivers, oceans, valleys, and deserts. Their very survival depends upon the characteristics of the land, air, and water in those areas, but their existence has become part of the fabric of what makes those places separate and distinct parts of Earth.

As living organisms, people have certain basic needs that must be met in order to survive. Goods and services from the natural world provide the resources to meet these needs. People are thus dependent on **natural systems**; they cannot survive without the goods and services these systems provide.

A **system** is a group of interacting elements forming a complex whole. The human body is an example of a living system, a washing machine a system that is not living. Systems are made up of parts that are interconnected to allow the whole to function. If one part ceases to function or functions poorly, the entire system suffers. The same concept applies to natural systems and **ecosystems**. A natural system is a system formed entirely by natural processes, such as the interaction of **ecological communities** with chemical and physical environments. For example, the surroundings in which a living thing exists include the type of soil, the shape of the land, the

amount of water and warmth, and the plants and animals that share the same space. These surroundings affect the way the organism goes about its daily life.

Ecosystems are made up of interacting, interrelated, or interdependent ecological communities, species, and nonliving elements such as soil, water, and air. An ecological community is a grouping of different species regularly found in the same location and often named for the dominant and most abundant species (sycamore woodland) or type of environment (rocky, intertidal environment). While species in a given community are intricately interrelated, not all species



directly interact. Mangrove swamps, the Great Plains, and the Amazon rain forest are examples of ecosystems made up of a multitude of ecological communities.

Humans benefit from both goods and services obtained from ecosystems. These goods and services are, in fact, essential to human life and to the functioning of human economies and cultures. **Ecosystem goods** are tangible materials produced by natural systems and used by humans to fulfill their needs and support their quality of life. Ecosystem goods include materials humans use for food, fiber, fuel, and pharmaceutical and industrial products. Different ecosystems yield different goods. All natural systems—aquatic, terrestrial, coastal, or marine—provide human communities with food, energy, clean air, building products, fiber, industrial products and their component parts, pharmaceuticals, genetic resources, and recreational resources. Goods provided by freshwater aquatic systems include: the water we drink, wash, bathe, and irrigate with; and use to produce many materials and goods on which our economies and cultures rely. Coastal and marine systems are very influential on our climates—their waters absorb the sun’s energy and the movement of these

waters influences the weather patterns that have determined human settlement on Earth since the beginning of human history.

Like climate, many of the functions and processes that take place in natural systems result in services essential to human life and the functioning of our economies and cultures. Flood control and the generation of new soil are two examples of ecosystem services.

While there is considerable overlap, different ecosystems provide different types of **ecosystem services**. Services provided by terrestrial (land) systems include oxygen production upon which human respiration depends; protection from ultraviolet radiation by stratospheric ozone; the cycling and movement of nutrients; pollination of crops and natural vegetation; and dispersal of seeds that influence food production. Ecosystem services provided by freshwater systems include oxygen production by tiny organisms; the productivity of spawning and nursery grounds upon which fisheries depend; the capacity of wetlands to detoxify waste; and the cycling and movement of nutrients through waterways which enhance soil fertility and resultant agricultural productivity. Services provided by coastal and marine systems include

Glossary

Characteristic: A feature or quality that distinguishes individuals or items within a group.

Ecological community: A grouping of different species found in the same location (e.g., sycamore woodland).

Ecosystem: Groups of interacting and/or interdependent biotic and abiotic components and factors in a specific area.

Ecosystem goods: Tangible materials produced by natural systems that are essential to human life, economies, and cultures.

Ecosystem services: Functions and processes in natural systems that are essential to human life, economies, and cultures.

Habitat: The place where an organism lives and meets its needs.

Natural system: The interacting and/or interdependent components, processes, cycles, and interactions among organisms and their habitats.

Organism: A living plant, animal or other life form capable of metabolic activity and reproduction.

System: A group of interacting elements such as organs that form a complex whole.

Systems thinking: Examination of the interactions of the components and processes that comprise natural and social systems.



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oxygen production and mitigation of loss and damage from flooding by absorption.

Studying natural systems can be challenging. An ecosystem is as large or as small as the boundary that describes it—all that is needed is a group of interacting, interrelated, and/or interdependent components and factors. The Amazon rain forest and the local park are both natural systems, although at different scales.

In examining natural systems, a logical first step is identifying **habitats**. A habitat is the place where an organism lives and meets its needs. Habitats are sometimes mistakenly thought of as the “homes” for living things; this definition limits habitat to an animal’s nest or the place where it sleeps

and/or bears its young. While an animal’s nest is part of its habitat, it is not the entire habitat. Habitats are places where animals and plants carry out all the necessary actions they need to in order to live: these places must provide the food, water, and shelter living things need to stay alive. Depending on the organism, a habitat may be small (a pile of decaying leaves to an earthworm) or large (an entire forest to a bear). Like natural systems, many smaller habitats exist within larger habitats, as in a forest or mountain range. Some organisms need only a small area in a forest or mountain range to meet their needs; others need acres and acres of the forest or part of a mountain range to carry out the functions they need in order to survive.

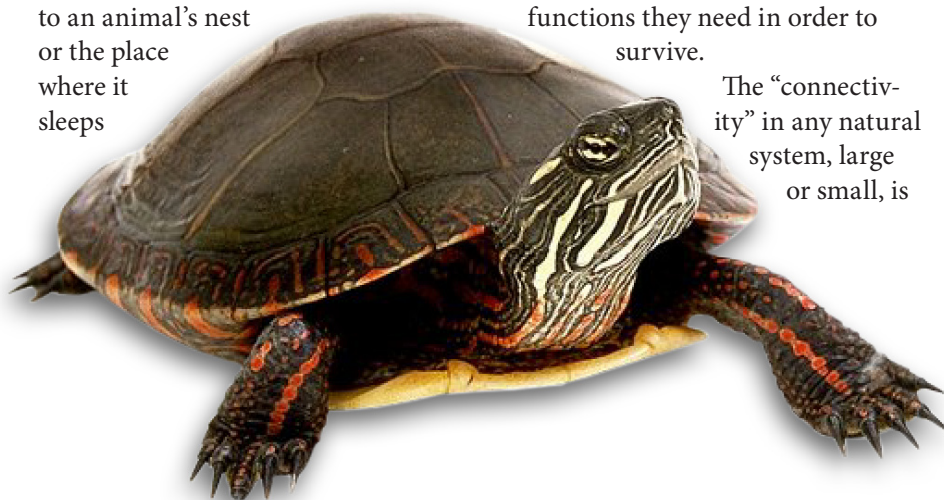
The “connectivity” in any natural system, large or small, is

amazingly intricate. A tree is an example of a simple ecosystem. A community living in this ecosystem often includes insects, snails, moss, fungi, plus the birds and mammals that nest or roost in the tree from time to time. Habitat for timber beetles includes the maze of tunnels they create under the bark of the tree. In this habitat, the beetles find the food, water, and the shelter they need to stay alive. Here they also lay their eggs, which hatch into grubs. The grubs feed on

fungi living in the same ecosystem.

The fungi, in turn, feed on the soft wood inside the tree. Meanwhile, the tree is: constantly using resources from the ecosystem surrounding it (air, water, nutrients in the soil, sunlight) to survive and grow; and, providing branches for birds to roost on, and food for birds and mammals to eat. This example illustrates a simple slice of the complex interconnectivity and interdependence of the parts of an ecosystem. As this example illustrates, living things cannot exist in isolation—they, like people, need resources from the natural system around them to stay alive. Where these basic needs are met defines the habitat in which the organisms live and grow.

Every ecosystem is unique, shaped by factors such as climate, altitude, soil, plants, and animals. Likewise, living organisms within an ecosys-





tem have characteristics that allow them to survive within the conditions or circumstances of that ecosystem. Desert plants, for example, are adapted to a very dry environment. Plants needing more water to survive could not live in a desert unless that environment was manipulated to provide the necessary water. Human communities have developed technology to allow people and other organisms to survive and grow in environments that typically would not support them. Irrigation represents one such technology. While irrigation is helpful for growing crops and some other types of plants (grass and shade trees, for example) in the desert, it influences parts of the desert ecosystem. Because the parts of the ecosystem are connected, a change to one part affects the other components and influences the functioning of the whole natural system.

Many ecosystems are delicate. A small change in one part of the system can create an imbalance throughout the entire ecosystem. The system's ability to respond to this imbalance determines whether the effect on the daily lives of humans and other living organisms relying on that system will be large or small.

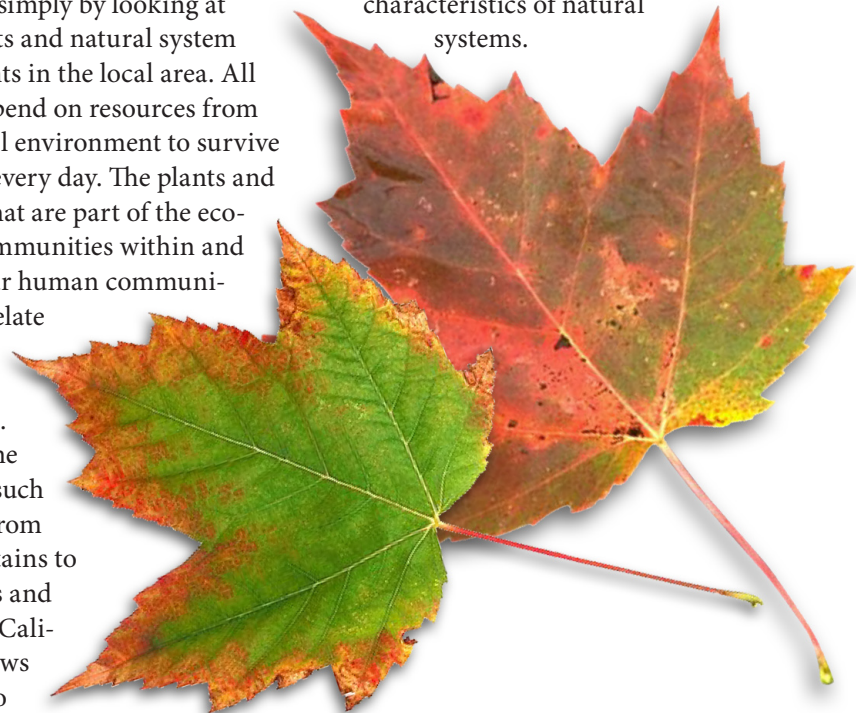
The learning objectives of this unit are related to **systems thinking**. Learning about some of the plants and animals that live in California leads to identifying the relationship between the characteristics of these plants and animals and the types of

environments in which they live. Understanding that different ecosystems (mountains, rivers, oceans, valleys, and deserts) have interconnecting parts and that the ecosystems themselves influence each other lays the groundwork for seeing the connection between humans' daily lives and the natural world around them. Humans are a part of, not separate from, the larger natural system. This is a key concept, because since the Industrial Revolution, humans have become the primary agent influencing ecosystem change. People use tangible materials (goods) from ecosystems on a daily basis and benefit from ecosystem services in a variety of ways. These goods and services do not exist as separate items on a grocery shelf. The availability of goods and services is connected to the health and existence of the natural systems from which they are obtained.

No matter where one lives in California or the world, the "big idea" that people depend on natural systems is evident simply by looking at the habitats and natural system components in the local area. All people depend on resources from the natural environment to survive each and every day. The plants and animals that are part of the ecological communities within and around our human communities interrelate and are interconnected. Tracing one resource, such as water, from the mountains to the oceans and deserts of California allows students to see water

as a connector between ecosystems, but also illustrates how interconnected the components of each ecosystem are in their dependence on water in every environment.

Human communities are part of these interconnections. The conditions in a valley make it suitable for the cultivation of crops for human consumption. These conditions include flat terrain, moderate climate, and soil rich in nutrients, but water also plays an important role in growing these crops. Humans and other organisms in the ecosystems also use and depend on other materials, including rock, sand, and minerals. The organisms in the ecosystems provide a variety of food and fiber products, as well as putting oxygen, which humans need to breathe, into the air. Exploring the various ecosystems and their characteristics develops appreciation of humans' reliance on natural systems and understanding of humans' influence on the characteristics of natural systems.



Unit Planner

Lesson	Learning Objective(s)	At a Glance
1	E Is for Earth <ul style="list-style-type: none"> List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area. 	Students discuss <i>The World Around Me</i> big book and work on individual books. Students present their ideas about different parts of an ecosystem and how they are connected in a concept map. A list of basic needs is generated.
2	R Is for River <ul style="list-style-type: none"> List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area. Name some of the plants and animals that live in their local area. Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing). 	Students study photo cards and a relief map of California. They participate in developing a concept map and create a “Flow of a River” diagram. They gather information to determine if their community is in a riparian area.
3	M Is for Mountain <ul style="list-style-type: none"> List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area. Name some of the plants and animals that live in their local area. Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing). 	Students study pictures of mountain animals and paste animal cutouts at different elevations of a mountain. They help develop a concept map about a mountain ecosystem and gather information to determine if their community is on or near a mountain.
4	V Is for Valley <ul style="list-style-type: none"> List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area. Name some of the plants and animals that live in their local area. Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing). 	Students define “valley” and identify why a valley is suitable for growing crops. They help develop a concept map and identify one way their daily life relates to valley resources. They gather information to determine if their school is in a valley.



	Prerequisite Knowledge	Duration (minutes)	Materials Needed	Textbook Alignment
	<ul style="list-style-type: none"> ■ Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say. ■ Students must be able to speak clearly enough to be understood by others. ■ Students need to understand simple oral directions and be able to gather information from pictures. 	Preparation: 20-30 min. Instruction: 55-60 min.	Big Book: <i>The World Around Me</i> Dictionary: One per class Examples of valley products: Collection of fruits, nuts, and vegetables grown in the Central and Salinas Valleys (or pictures cut from supermarket ads) Plant: One per class Rock: One per class Toilet paper or paper towel tubes: One (paper towel) or two (toilet paper) per pair Class supplies: Chart paper, marker, pencils, crayons or colored pencils, glue Activity Masters: Listed with each lesson Visual Aids: Listed with each lesson	To be inserted
	<ul style="list-style-type: none"> ■ Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say. ■ Students must be able to speak clearly enough to be understood by others. ■ Students need to understand simple oral directions and be able to gather information from pictures. 	Preparation: 30-40 min. Instruction: 50-60 min.		
	<ul style="list-style-type: none"> ■ Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say. ■ Students must be able to speak clearly enough to be understood by others. ■ Students need to understand simple oral directions and be able to gather information from pictures. 	Preparation: 10-15 min. Instruction: 55-60 min.		
	<ul style="list-style-type: none"> ■ Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say. ■ Students must be able to speak clearly enough to be understood by others. ■ Students need to understand simple oral directions and be able to gather information from pictures. 	Preparation: 5-10 min. Instruction: 45-55 min.		

Unit Planner

	Lesson	Learning Objective(s)	At a Glance
5	D Is for Desert	<ul style="list-style-type: none"> ■ List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area. ■ Name some of the plants and animals that live in their local area. ■ Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing). 	Students identify some of the challenges plants and animals have living in a desert and discuss how their basic needs are met. They also identify some ways humans benefit from resources found in a desert. They gather information to determine if their school is in a desert.
6	O Is for Ocean	<ul style="list-style-type: none"> ■ List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area. ■ Name some of the plants and animals that live in their local area. ■ Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing). 	Students study a relief map of California to identify where rivers enter the Pacific and locate major cities. They view underwater photos, help develop a concept map, create an ocean mural, and gather information to determine whether they live near the ocean.



	Prerequisite Knowledge	Duration (minutes)	Materials Needed	Textbook Alignment
	<ul style="list-style-type: none"> ■ Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say. ■ Students must be able to speak clearly enough to be understood by others. ■ Students need to understand simple oral directions and be able to gather information from pictures. 	Preparation: 5-10 min. Instruction: 50-60 min.	Big Book: <i>The World Around Me</i> Dictionary: One per class Examples of valley products: Collection of fruits, nuts, and vegetables grown in the Central and Salinas Valleys (or pictures cut from supermarket ads)	To be inserted
	<ul style="list-style-type: none"> ■ Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say. ■ Students must be able to speak clearly enough to be understood by others. ■ Students need to understand simple oral directions and be able to gather information from pictures. 	Preparation: 30 min. Instruction: 40-45 min.	Plant: One per class Rock: One per class Toilet paper or paper towel tubes: One (paper towel) or two (toilet paper) per pair Class supplies: Chart paper, marker, pencils, crayons or colored pencils, glue Activity Masters: Listed with each lesson Visual Aids: Listed with each lesson	

Differentiated Instruction & Extensions

Strategies for Below-Level Readers

Provide additional guidance when asking for verbal descriptions of places and things. For example, instead of saying, “Tell me about one of the animals you see in the picture,” rephrase to, “Tell me something about this toad. What color is it?” This additional structure will also help students focus and relate their responses to the topic or purpose of the conversation.

Shorten a writing task. Instead of asking students to write their names on a paper, have them fill in just the first or the first and last letters of their first names. The other parts of each student’s name should be provided in advance, with underscoring where the first or first and last letters should be printed.

Provide more structure to a writing task. Instead of having a student

Strategies for Above-Level Readers

Have students compare and contrast characteristics of animals, plants, or entire ecosystems instead of just describing them. Comparing and contrasting sometimes involves focusing on multiple characteristics at once. Challenge the students to focus on behaviors as characteristics of animals, not just their physical appearances.

Assign students to explain how weather and other seasonal changes influence different parts of an eco-

system as well as the ecosystem as a whole. This challenge involves thinking about cause and effect and is more complex than simply describing how an ecosystem—or parts of an ecosystem—change through different seasons and weather conditions.

Have students describe and analyze specific weather changes and the way these changes affect living things in the environment around the school. This challenge involves observation skills as well as analysis. Have

Extension Ideas

Create a mural-sized collage on the classroom wall, showing the five different ecosystems studied in the unit. Label each ecosystem and have students describe some of the characteristics of each ecosystem. Students

can write a sentence about the characteristics (using invented spelling on the words not covered in the unit).

Create a simple guidebook of plants and animals for each ecosystem studied in this unit. Select plants



write a letter of the alphabet independently, have a faint outline of the letter already printed. The student then traces over this outline and gains the satisfaction of printing the letter correctly.

Allow extra time to complete assigned tasks. Some students may need more time to write or draw. They may also need more time in verbally expressing a thought or providing

an oral response to a question. One way to give a student more time to formulate a verbal response is to tell the student you will be calling on him/her after you first listen to another student. Also tell students what they will be expected to explain (for example, say “Tami, it will be your turn after Tony’s. I will ask you to tell us about the beaver. Do you see the beaver in the picture?”)

Pre-teach some basic concepts and skills. For example, before you begin a group lesson, individually explain to a student the meaning of one or two vocabulary words. Using pictures and/or other visual cues is effective in pre-teaching a concept.

students generate a list of weather-related words and write them using invented spelling.

Ask for greater details as students describe or compare and contrast different animals, plants, and ecosystems. This challenge can lead to improved observational and analytical skills, as well as vocabulary development.

Give students more complex tasks. Instead of just drawing an animal in an ecosystem in which it is found,

students can show at least one way in which the ecosystem meets the animal’s basic need (for example, where it goes for protection or shelter, where it gets its food).

Challenge students to write entire sentences versus having them complete sentence stems provided for them. Encourage the students to include more detail and explanations in what they write.

Provide additional print materials about the topic being studied. These

materials could include maps, informational brochures, children’s books, and printouts from websites. Even if the students cannot read all the print material, they may be able to read a headline or identify individual words. They may also be able to interpret photos as well as simple charts and tables.

Give students a clipboard and pencil and have them make field notes as they study different ecosystems and parts of ecosystems.

and animals for each ecosystem and assign individual students to create pages for the selected plants and animals. Compile the class books using the pages students contribute.

Unit Assessment

Traditional Assessment

Description:

There are three parts to this assessment. Call attention to the words “Part One” (on side one), “Part Two” and “Part Three.” Tell the students that they will be doing one part at a time. Lead them through the completion of one part at a time.

Instructions:

Explain Part One

Call attention to the question, “Where Could an Animal Live?” and to the photos of the five ecosystems they studied. The students should think about the habitats (where animals live) in each ecosystem. They should draw a circle around a place in (or part of) each ecosystem where an animal might live. Have them tell a partner what they circled and what animal might live there. Look at each student’s work and listen to what they tell their partner. Ideally, a classroom aide or parent volunteer would be available to help with this.

Explain Part Two

Call attention to the question “Who Lives Here?” Tell the students to think of some of the plants and animals that live in one of the ecosystems that they have just studied. Have them draw a picture of one plant and one animal that lives in one of the ecosystems.

Explain Part Three

Call attention to the question, “What Resources do I use?” Remind them that “resources” means things we use. Have the students write a list of three resources they use regularly.




Unit Assessment Instruments


The World Around Me


Unit Assessment - Part 1 (Activity Master)


Name _____


Where Could an Animal Live?

R is for  **River**

M is for  **Mountain**

V is for  **Valley**

D is for  **Desert**

O is for  **Ocean**

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Part One:

Correct answers will vary. These answers include (but are not limited to) the following:

Mountain: tree, rocky ledge or cave

River: rocks, mudflats, rushes, water

Valley: fruit trees, tall grasses, soil

Desert: creosote bush, rocks

Ocean: kelp, sandy shore, water

The World Around Me

Unit Assessment - Part 2 (Activity Master)

Name _____

Who Lives Here?

Plant	Animal

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Part Two:

Answers will vary, but should represent plants and animals found in the local community

The World Around Me

Unit Assessment - Part 3 (Activity Master)

Name _____

What Resources do I Use?

1. _____
2. _____
3. _____

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Part Three:

Answers will vary, but should represent resources students use on a regular basis. These resources may be general (water, air, food, clothes, etc.) or more specific (apples, paper, shoes, etc.).

Unit Assessment

Alternative Assessment

Description:

This unit was developed around the following learning objectives:

- List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area.
- Name some of the plants and animals that live in their local area.
- Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing).

Information gathered through the assessments embedded in the lessons should assess mastery of Kindergarten Science Standard 3.a. To document progress in relation to these objectives, it is helpful to document performance of individual students during the lessons using an efficient and systematic process. Work samples (drawings and worksheets) can be saved, but observation notes should also be a part of the documentation process. Taking brief quick notes during class discussions should be a part of the process. Involving a classroom aide or parent volunteer in this process should be considered.

Suggested Scoring

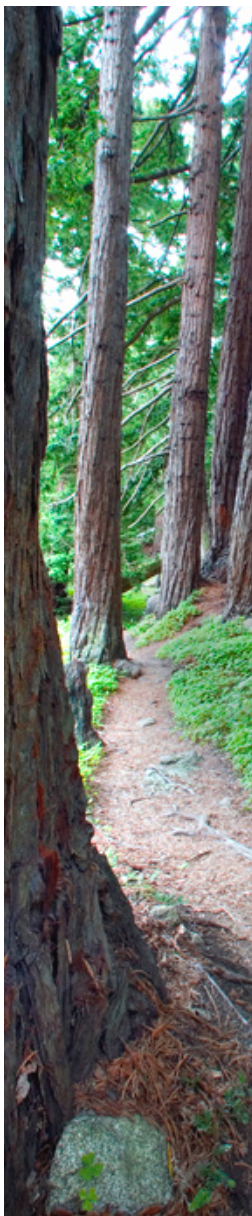
In addition to open-ended notetaking and completion of the assessment checklists for each lesson, a summary checklist can also be used to keep track of progress in relation to the specific EEI Learning Objectives. Parts of the following checklist can be completed at the end of each lesson. Dates should be used when recording progress versus simple checkmarks.

Comments can include ideas for intervention (how to help the students make progress towards the objectives).

Unit Alternative Assessment Scoring Checklist

Student's Name			Comments
Names plants in local area	<div> <div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div> </div> <div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Named 4 local plants
Names animals in local area	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Named 6 local animals
Identifies river habitats	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Described three characteristics of river habitats
Identifies mountain habitats	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Described five characteristics of mountain habitats
Identifies valley habitats	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Identified five characteristics of valley habitats
Identifies desert habitats	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Identified one characteristic of desert habitats
Identifies ocean habitats	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Identified three characteristics of ocean habitats
Identifies resources people use in everyday life	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	<div> <div>___</div> <div>Mastered</div> </div> <div> <div>___</div> <div>In Progress</div> </div> <div> <div>___</div> <div>Not Demonstrated</div> </div>	Identified six resources people use in everyday life

Unit Resources



Resources for Students

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Desert USA. <http://www.desertusa.com>

JCU Language and Learning Services. Mind Mapping. James Cook University. <http://www.jcu.edu.au/studying-services/studyskills/mindmap/howto.html>

National Geographic Society. Map Machine. www.nationalgeographic.com/mapmachine

National Marine Sanctuary Program. Oceans Live. National Oceanic and Atmospheric Administration. <http://oceanslive.org>

National Museum of Natural History, Smithsonian Institution. <http://www.mnh.si.edu>

Sanctuary Web Group. Encyclopedia of the National Marine Sanctuaries. National Oceanic and Atmospheric Administration. <http://marinelife.noaa.gov>

Instructional Support

Agencies, institutions, and organizations throughout California have identified themselves as providing programs and materials that support this unit. Links to these resources are available at: http://www.calepa.ca.gov/Education/EEI/instructional_support.html

Lesson 1



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E Is for Earth

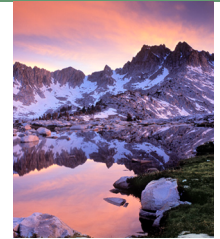
Two “big ideas” or major concepts provide the framework for this lesson: (a) living things (including humans) depend on resources from the natural environment to survive and (b) plants and animals are interconnected and interdependent components of a natural system.

The World Around Me, a big book with detailed pictures draws students into five different ecosystems found in California. Through guided discussion, students discover the unique features of these ecosystems, how water connects the five ecosystems, and how humans depend on the resources from these ecosystems to

survive. Students also begin creating individual books to be used in the other lessons in this unit.

The World Around Me and *E Is for Earth* books help students follow words from left to right and understand and follow one- and two-part oral directions. Related discussions

framed by inquiry questions help students describe places and things, while creating individual books allows them to see their ideas in print. Students’ participation in concept mapping helps them recognize the connections within and between the parts of an ecosystem.



Learning Objective

List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area.

Name some of the plants and animals that live in their local area.

Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing).



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California is comprised of the five environments being studied—mountains, rivers, valleys, oceans, and deserts. Examining the local area students experience on a daily basis provides an opportunity for firsthand exploration of the characteristics of at least one of these ecosystems. Such exploration brings a realization of how humans and communities, like organisms, depend on the ecosystem(s) in the local area to meet basic needs.

Water is found in all the ecosystems and serves as a connector between the ecosystems and, sometimes, between the parts of an ecosystem. The form, movement, force, and amount of water, however, differ from one ecosystem to another. On mountain summits, water is often in the form of snow. As the snow melts, water flows rapidly down the sides of the mountains, sometimes forming waterfalls and forcing movement of rocks. Water flowing through a valley may be in the form of a river; in a desert, water may be almost entirely unseen, existing far underground. Water in the ocean is salty and moves in layers. The form and availability of water plays a major role in the kinds of plants and animals that live in any particular ecosystem.

Background

All living things have basic needs that must be met in order to survive. These basic needs include food, water, and shelter (or protection). Living things depend on natural systems for resources to meet their needs. A healthy ecosystem has enough resources to go around—not all of the organisms compete for the same thing at the same time. Different plants within

an ecosystem grow and flower at different times of the year. Different animals hunt and eat different kinds of food, in different places, at different times of the day. Specific characteristics of different organisms, including their behaviors, allow them to thrive in their natural environment. While organisms within a single ecosystem are tremendously diverse, even more biological diversity exists across ecosystems.

Key Vocabulary

Basic needs: What living things need to stay alive.

Community (ecological): A grouping of different living things found in the same place.

Connector: Something that joins other things together.

Ecosystem: A “system” made up of living and nonliving things that exist together.

Resources: Sources of support for daily life, like fresh water.

Survive: To remain alive.

Toolbox



Summary of Activities

Students discuss *The World Around Me* and begin construction of individual books. Students present their ideas about different parts of an ecosystem and how they are connected in a concept map. They generate a list of basic human needs.



Instructional Support

See Unit Resources, pages 20-21

Prerequisite Knowledge



- Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say.
- Students must be able to speak clearly enough to be understood by others.
- Students need to understand simple oral directions and be able to gather information from pictures.

Advanced Preparation



Create individual books:

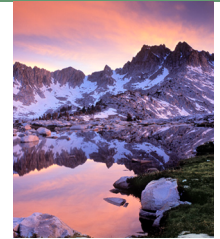
Compile an individual *E Is for Earth* (Lesson 1 Activity Master) book for each student by copying, folding, and stapling the pages provided.

Prepare Activity Masters:

As indicated in the Activity Masters section.

Prepare Visual Aids:

Produce materials as indicated in the Visual Aids section.



Materials Needed



Plant:
One per class

Rock:
One per class

Class Supplies:
Chart paper, marker, pencils

Activity Masters:
See below

Visual Aids



Big Book:
The World Around Me

Duration



Preparation time:
20-30 min.
Instructional time:
55-60 min.

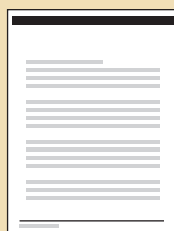


Safety Notes
None

Activity Masters



E Is for Earth
Page 76
One per student



**Ecosystems
Assessment
Checklist**
Page 82
One per class

Procedures

Step 1

Display a rock and a plant (or point to a plant growing outside). Ask students to identify what makes these two things different. After some discussion, lead them to understand that the plant is alive, the rock is not living. Help the students identify some of the characteristics of living things. Ask them to speak in complete sentences as they share their ideas. (*Living things eat; living things make or take in food and water; living things grow; living things make new living things; most living things are made up of parts.*)

Step 2

Ask students, “What do living things need to stay alive?” (*They need water, food, shelter/a place to live.*) Write these words on the board: “water,” “food,” “shelter.” Explain that these three things are called basic needs because, without them, living things can not survive. Explain that people have basic needs just like all other living things. Have each student name one thing they used today that helped them meet a basic need of food, water, or shelter/place to live. (*Note: Clothing may be used as a form of shelter/protection.*)

Step 3

Ask students to think about how living things get what they need to stay alive: How do they get their food, water, and shelter? After some discussion, introduce the word “ecosystem.” Underline the word “system” and explain that a system is made up of parts that work together—like the parts of a bicycle (the wheels, chain, brakes, etc.). Explain that an ecosystem is an environment or place made up of different living and non-living parts that are connected. Also explain that plants and animals need an ecosystem to survive. Go back to the idea of the rock and the plant. The plant can survive only if its surroundings provide what it needs to stay alive. Tell students that we live in a world (Earth) that gives us what we need to stay alive. Have them give some examples of what we get from Earth to stay alive. (*Food, water, air, soil.*)

Step 4

Remind students that an ecosystem is one kind of system—a system that includes living things. Tell them that there are other kinds of systems. For example, a bicycle is a system. A bicycle has different parts that are connected and act together to make the bicycle work. If a wheel falls off, the bicycle will not work because one important piece is missing. If you take the bicycle apart and pile all the pieces on the floor, the bicycle still will not work, because the pieces need to be connected in a way that allows them to work together. The parts working together are what make a system.

Step 5

Show the class the cover of *The World Around Me* (Lesson 1 Visual Aid), and read the title as you point to each of the words. Ask students to predict what the book is about. Once they have made their predictions, inform students that the book shows five different ecosystems in California. Tell them again that an ecosystem is an environment or place, and the living and nonliving things in that environment; the living and nonliving things are connected in ways that support survival (that is, help keep living things alive).

Step 6

Go through the pages of Part 1 of the *The World Around Me*, asking students to look closely at the pictures to learn something about each ecosystem. For each page, read the heading and point to the words as you do so: R Is for River, M Is for Mountain, and so on. Spend time on each page, encouraging the students to talk about the characteristics of each ecosystem (river, mountain, valley, desert, and ocean) rather than just the living and nonliving parts of the ecosystems. For example, when studying the mountain, focus on such concepts as peaks, high areas and low areas, snow, and rocks. For this lesson, the goal is to learn the general characteristics of each ecosystem. Students will learn more about each ecosystem’s animals, plants, and resources used by humans later in the unit. Use the following questions and strategies to stimulate analysis of the pages:



River: What does a river carry? (*Water*) What makes a river different from water in a bucket or bathtub? (*There is a lot more water in a river and it moves or flows.*) What do we call the sides of a river? (*Banks*) Write the word “bank” on the board and talk about the same word having different meanings: “bank” can mean a container that holds money or a slope of land next to a body of water. Show with your hands or arms the shape of a river like the one in the picture.

Mountain: What is the tallest thing you see in this picture? (*Mountain*) What do you see on the high part, or peak, of the mountain? (*Snow*) Why do you think there is more snow on the peak than at the base or bottom of the mountain? (*It is colder on the high land.*) What do you notice about the trees on the mountain? (*No trees grow at the top.*) Show with your hands or arms the shape of a mountain like the one in the picture.

Valley: How is the valley different from the mountain? (*It is low and flat while the mountain is high and has peaks.*) What do you see surrounding the valley? (*Mountains*) Show with your hands or arms the shape of a valley like the one in the picture.

Desert: What do you see in the desert? (*Sand, rocks, bushes.*) Do you see any tall trees? (*No*) What else do you know about a desert? (*It is dry, other answers.*) Show with your hands or arms the shape of a desert like the one in the picture.

Ocean: How would it feel if you were standing in the ocean? (*You would feel wet; you could smell or taste salt; waves would bump against you.*) What else do you know about an ocean? (*It is large, other answers.*) Show with your hands and arms the shape of an ocean like the one in the picture.

Step 7

Go page by page through *The World Around Me - Part 1* again. Tell students to look closely at each ecosystem to see if they can find one thing that appears on every page. Tell students this is a time just for looking, not for talking. Turn the pages of the book very slowly without comment from you or the students. Once the students identify water as being a part of each ecosystem, talk about water as being a connector for all the ecosystems; that is, water from one ecosystem often flows into other ecosystems, and the animals and plants that live in the different ecosystems all need water to survive.

Step 8

With the students’ input, create a simple but large concept map with “The World Around Me” in the center and the different ecosystems as “connectors” to it. Make the concept map on chart paper and display it throughout the unit. (*See the example in The World Around Me - Part 2*). Use the following questions in developing this concept map:

- What are the five California ecosystems? (*River, mountain, valley, desert, ocean.*)
- What are some of the things that describe each of these ecosystems? (*High, low, snow, sand, rocks, trees, water, grass, sun, other answers.*)

Also draw connecting lines between water and each of the ecosystems. (*See the example in The World Around Me - Part 2*).

Step 9

Give each student an individual *E Is for Earth* (Lesson 1 Activity Master) book (prepared in advance). Call attention to the title *E Is for Earth* while you point to each word. Ask, “What do you think Earth means?” Help students understand that Earth is where we live and where all the ecosystems are located. Tell students that they will need to listen and follow directions very closely to make a book about California ecosystems. Have the students put their names in the space provided on the cover of their individual books. Then have them turn to the first page. Have them identify the line drawing as a river and have them fill in the letter “R” to complete the sentence, “R Is for River.” Follow this procedure for the additional pages, having them fill in “M Is for Mountain,” “V Is for Valley,” “D Is for Desert,” and “O Is for Ocean.” Collect their individual books when time is up.

Lesson Assessment

Instructions

Description:

Student assessment for this lesson is performance-based and embedded throughout the lesson. The embedded assessment consists primarily of inquiry questions with oral responses. What is being assessed is the student's knowledge and understanding of concepts relating to the EEI Learning Objectives. Their skill in comparing and contrasting is also being assessed. To estimate or determine each student's knowledge, understanding, and skill, all students need to participate actively in the discussion, and their individual responses should be evaluated for accuracy. Students should also be asked to explain some of their ideas to check for any misconceptions. Where appropriate, students should be asked to speak in complete sentences.

Instructions:

Have students describe what they see in the illustrated pictures of *The World Around Me* (Lesson 1 Visual Aid), identifying at least one way in which the ecosystems are alike and one in which they differ. Use the following statements and questions to guide the discussion:

1. How are rivers and oceans alike?
How are they different?
2. How are rivers and valleys alike?
How are they different?
3. How are mountains and valleys alike? How are they different?
4. How are deserts and oceans alike?
How are they different?

If students have trouble with any of these concepts, more examples should be given. Students can also be asked to explain certain concepts to each other.

Suggested Scoring

Use the **Ecosystems Assessment Checklist** (Lesson 1 Activity Master).

Ecosystem Assessment Checklist (Lesson 1 Activity Master)

[illegible]



Lesson 2

R Is for River

This lesson focuses on rivers as ecosystems and includes information about where river water comes from and how it flows from one ecosystem to another. By following the journey of a river and noting how different animals and plants thrive at various places along the river, students grasp the relationship between habitat and adaptation.

Students discover that water is a resource and natural **connector** among the ecosystems that make up the world in which they live; they also learn that the story of the river is part of their own story.

Students are actively engaged in this lesson by sharing information and ideas about what they see in pictures depicting animals, plants, and other natural features of a river ecosystem. They participate in con-

cept mapping, study a relief map of California to identify major rivers, and develop a diagram depicting the course of a river. Students also follow words from left to right, describe places and animals, and follow oral directions.

Learning Objectives

List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area.

Name some of the plants and animals that live in their local area.

Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing).



Background

Varied animals and plants live in and near rivers (riparian areas). Their physical features and behaviors suit them to survival in the part of the river ecosystem in which they live. They must be able to adjust to an environment that can change dramatically from season to season and from place to place.

The flow of water in a river changes along its course. It flows fast over

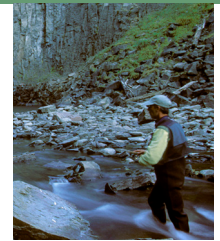
rocky beds in the mountains and slowly as it gets close to the sea, where river beds often have sandy or muddy bottoms. The **habitats** for animals in and along the river vary as the river moves along its course. Some animals are aquatic dwellers, like fish. Others are land dwellers, like egrets and other wading birds. Some live both in the water and on the land, like otters. Each animal in the river ecosystem is adapted to survive in the habitat in



which it lives.

The entire area of land draining into a specific river or river system is called a watershed. Water drains from the highest elevations within the watershed to the lowest. In a large watershed, dozens of small rivers and streams may flow, eventually, into a main river. Most of California's rivers are part of a watershed that drains into the Pacific Ocean. Parts of eastern California and the Southern San Joaquin Valley are in the Great Basin watershed, an area of the United States that does not drain into any ocean; instead, river water drains into natural reservoirs, including Lake Tahoe and Mono Lake.

Rivers and river ecosystems help people meet their basic needs for food and water. While fish, waterfowl, and plants are directly harvested from rivers for human use, the water from rivers is also used for drinking, washing, manufacturing, growing other foods (irrigating crops), and generating electrical power for cities. Water is a connector that ties humans to river ecosystems and connects the parts of the river ecosystem. Water also connects river ecosystems to the other ecosystems (mountains, valleys, deserts, and oceans) on Earth.



Key Vocabulary

Connector: Something that joins other things together.

Habitat: The place where a living thing lives and meets its basic needs.

Toolbox



Summary of Activities

Students study photo cards and a relief map of California. They participate in developing a concept map and create a “Flow of a River” diagram. They gather information to determine if there is a riparian area in their community.



Instructional Support

See Unit Resources, pages 20-21

Prerequisite Knowledge



- Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say.
- Students must be able to speak clearly enough to be understood by others.
- Students need to understand simple oral directions and be able to gather information from pictures.

Advanced Preparation



Make copies:

Make copies as indicated in the Activity Masters section below.

Create river diagram:

On chart paper, make a large copy of the “Flow of a River” diagram from Part 2 of *The World Around Me* (Lesson 1 Visual Aid).

Cut out “River Boat Ride” tickets:

Cut out “River Boat Ride” tickets provided as an Activity Master (see below).

Make binoculars or spy glasses:

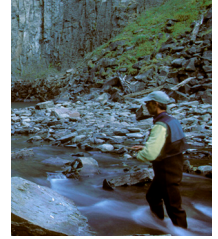
Collect empty toilet paper tubes and/or paper towel tubes and use them to make binoculars (two toilet paper tubes taped together) or a spy glass (one paper towel tube) for each pair of students.

Arrange for assistance:

If possible, arrange for a classroom aide or parent volunteer to assist with this lesson. Explain what you would like them to look for when assessing students’ understanding of the related concepts (see Student Assessment).

Prepare Visual Aids:

Produce materials as indicated in the Visual Aids section.



Materials Needed



E Is for Earth books:

From Lesson 1

Toilet paper or paper towel tubes:

One (paper towel) or two (toilet paper) per pair

Class Supplies:

Chart paper, crayons or colored pencils, marker, pencils

Activitiy Masters:

See below

Visual Aids



Big Book:

The World Around Me

Map:

Relief Map of California, page 93

Photo cards:

Animals in a River Ecosystem, pages 94-98

Duration



Preparation time:

30-40 min.

Instructional time:

50-60 min.



Safety Notes

None

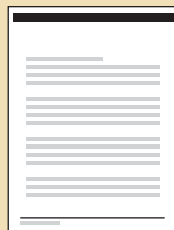
Activity Masters



River Boat Tickets

Page 83

One per student



River Assessment Checklist

Page 84

One per class

Procedures

Step 1

Show students the “R Is for River” page in *The World Around Me* (Lesson 1 Visual Aid). Call attention to human activity such as the river boat depicted in the picture, as well as some of the plants and animals and the places where they live (ducks in the shallow water, and worms that burrow in the sand). Tell students that where an animal lives is called its habitat; in its habitat, an animal finds what it needs to stay alive (food, water, shelter). Explain that rivers provide many different kinds of habitats for animals and plants; the way the water flows or moves makes a big difference in the kinds of animals and plants that can survive in a river or in a certain part of a river.

Step 2

Explain the difference between habitat and ecosystem. Habitats exist within ecosystems. Like a school that is part of a neighborhood, a habitat is one part of an ecosystem. A habitat is the place in an ecosystem where an organism lives and meets its needs. An ecosystem is an environment or place that is made up of different living things and non-living things that are connected and that help other living things survive.

Step 3

Call attention to some of the habitats depicted on *The World Around Me* “R Is for River” page: mudflats, shrubs, sandbanks, rocks in the water, grasses, and so on. Write the words “dwell,” “dwelling,” and “dweller” on the board. Have the students identify what is the same in all three words (the letters d-w-e-l-l). Explain that “to dwell” means to live in a certain place. Write the words “**aquatic dwellers**” and “**land dwellers**” on the board. Ask the students to guess what a land dweller is (*someone or something that lives on the land*). Have the students look at the “R Is for River” page and identify some land dwellers (*birds and insects*). Mention that the term “dweller” usually refers to animals and people—not plants. Ask the students to guess what an “aquatic dweller” is (*someone or something that lives in the water*). Also have them identify some of the aquatic dwellers pictured on the “R Is for River” page (*fish, snails, clams*). Point out that some animals live both on the land and in the water.

Step 4

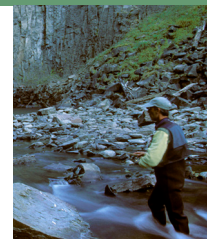
Call attention to the duck in the picture on the “R Is for River” page. Tell them that this duck gets food by digging in the mud with its beak. Also call attention to the kingfisher with an insect in its mouth. Ask, “Is the kingfisher a living thing? Is the insect a living thing?” Explain that living things often eat other living things in their ecosystem in order to survive. Have the students give other examples of this (spiders eating insects, bears eating fish, eagles eating rabbits). Remind the students that all the living and nonliving things shown in the river picture make up the river ecosystem—that all these things are connected and help the living things to survive. Have students give examples of the how things in the river ecosystem are connected.

Step 5

Discuss the different sections of a river (rapids, meanders, oxbow lakes). Have students look closely at the picture and identify how the conditions along the river and the habitats in and near the river differ along the course of the river. Explain that most rivers start as fast-flowing streams in the hills or mountains. As a river reaches lower ground, its slope is less steep and the water flow becomes smoother. At the lower levels, the water is calmer and the sand and mud tends to settle. Some animals such as worms and mussels bury themselves in the mud. In the shallower water, some weeds take root. Explain that the mud is a habitat for worms, mussels, and other animals.

Step 6

Tell students they will be going on a river boat ride today to look more closely at some of the animals that live in or near a river. Give each student a “River Boat Ticket.” Pair students and invite them on board. Give each pair binoculars (toilet paper tubes fastened together) or a spy glass (single paper towel tube). Also give each pair a Photo Card depicting an ani-



mal living in the water or on the bank of the river. Allow time for students to closely observe the features of the animal and what they see around it (for example, water, mud, sand, tree, bush). Tell them to discuss their observations of animals and habitats with their partners. Ideally, classroom aides or parent volunteers would be involved in this part of the lesson so that every student has an opportunity to share and be given feedback.

Step 7

Tell students you are docking the boat and that they should gather in a circle to tell everyone about their animal and its habitat. Encourage students to speak audibly in complete, coherent sentences. As they take turns describing their animals, use guided questions to encourage them to make connections between the animal and its habitat:

- Does this animal live in the water of the river or on the land near the river?
- How does this animal use the parts of the river ecosystem to live?
- What does this animal eat? Where does it go for shelter? Where does it sleep?

Write student responses on chart paper.

Step 8

With student input, develop a concept map depicting some of the parts and connectors in a river ecosystem. (See the example in *The World Around Me - Part 2*.) Start the discussion by asking, “What are the parts of a river ecosystem?”

Step 9

Ask students, “Why are rivers important to us?” (They provide fish, water for crops, water for other human uses such as drinking and bathing.) Use other leading questions to help students make connections between humans and some of the resources we get from a river ecosystem:

- Can you think of something in the grocery store that comes from a river? (Water, fish)
- Have you used anything today that comes from a river? (Water)
- Can you think of something in our town or city that has a connection to a river? (Water tower, water pipes, water treatment plant)
- Can you think of something in our school that has a connection to a river? (Water, water pipes)
- What is the closest river to our school? (Answers will vary.) How do people use this river? (Irrigation, boating, fishing, kayaking, transporting people and goods, other answers.)

Step 10

Use the **Relief Map of California** (Lesson 2 Visual Aid) to locate the river closest to students’ city or town. Ask students to think about where the water in the river comes from and where it might be going. Have students trace the flow of the river on the map with their fingers. Ask them to connect the mountains to the river and the river to the ocean. Have them look at the “Flow of a River” diagram you have enlarged from *The World Around Me - Part 2*. Call attention to the way water comes from many sources and directions to enter a river and then the ocean.

Step 11

Return students’ individual *E Is for Earth* (Lesson 1 Activity Master) books. Have them turn to the river page and add (by drawing) some parts of the river ecosystem (for example, plants, animals, mud). Give them time to describe what they drew. Ideally, classroom aides or parent volunteers will be involved in this part of the lesson so that each student will have a chance to share and be given an opportunity for feedback. Collect the books when students have completed their work.

Lesson Assessment

Instructions

Description:

Student assessment for this lesson is performance-based and embedded throughout the lesson. The embedded assessment consists primarily of inquiry questions with oral responses. What is being assessed is the student's knowledge and understanding of concepts relating to the EEI Learning Objectives. To estimate or determine each student's knowledge, understanding, and skill, all students need to participate actively in the discussion, and their individual responses should be evaluated for accuracy.

Students should also be asked to explain some of their ideas to check for any misconceptions. Where appropriate, students should be asked to speak in complete sentences. For this lesson, it would be ideal to have classroom aides or parent volunteers to assist in listening to individual student's responses and provide appropriate feedback, because some of the activities involve students working in pairs and then describing their ideas to each other.

Instructions:

Each student should have a chance to discuss the following with a teacher or another adult prepared to assess students' responses and provide feedback:

1. Describe an animal that lives in the river ecosystem. How does it survive in its habitat within a river ecosystem?
2. How are the habitats along a river different?
3. How do animals have their basic needs met by a river ecosystem? What does your animal eat? Where does it find its food? Where does your animal go for shelter?
4. What do people get from the river that they use in daily life?

Suggested Scoring

Use the **River Assessment Checklist** (Lesson 2 Activity Master) to record students' performance.

Rivers Assessment Checklist (Lesson 2 Activity Master)

Student's Name	Can describe a river animal, plant or habitat	Can identify how a river-dwelling animal's needs are met	Can identify how parts of a river ecosystem are connected	Can identify how river resources are used by people	Can use vocabulary words in meaningful context
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Lesson 3



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M Is for Mountain

This lesson focuses on mountains as one ecosystem in California. By learning about the features of mountain ecosystems and the plants and animals that live on mountains, students become more familiar with the characteristics of a mountain environment.

Students also discover that some human basic needs are met through resources obtained from mountain ecosystems. A “big idea” of this lesson is that mountains are a major source of water for humans and other living things, especially forests. In some parts of California, mountains are covered by forests.

Students are actively involved in this lesson completing sentence stems about animals and their habitats, helping construct a concept map, and adding information to their individual books. Concepts introduced and/or reinforced include connections within an ecosystem and across ecosys-

tems, weather changes, and humans’ dependence on natural goods and systems. English-Language Arts skills supported include following words from left to right, describing places and animals, and using letters and phonetically spelled words to write about objects or events.



Background

Dramatic changes in **elevation** and varied climatic zones contribute to diverse plant and animal life in California's mountain ecosystems. The mountain ecosystem presents special challenges for both plants and animals. At higher elevations, mountain habitats have long, cold, snowy winters and short, wet, cloudy summers. Mt. Whitney, the highest mountain in California, has snow on its **peak** year-round.

A range of plant life exists on mountains, from trees to shrubs to lichens and mosses. Soil on some mountains is thin and stony, and conditions are dry, windy, and cold. In other California ranges, the windward side of mountains may have more precipitation than the lowlands. Especially at higher elevations, plants grow slowly and hug the ground. Above the **tree line**, which generally begins at 10,000 feet, large plants such as trees can not survive.

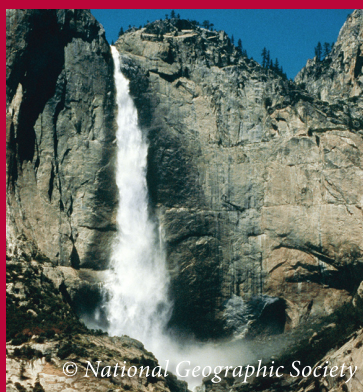
Some animals spend only part of the year on the mountain, as food is scarce and the climate challenging during the winter. Other animals hibernate through the winter on or near

Learning Objective

List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area.

Name some of the plants and animals that live in their local area.

Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing).



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the mountains. Hibernation is an adaptation that allows animals to survive the time of the year when food is scarce. A small number of especially hardy animals continue to be active during the winter. Some change color from season to season to better blend in with their surroundings.

Many rodents on high mountains (like marmots and voles) live in underground tunnels. They **hibernate** in these tunnels but come out to search for food among the rocks. Their earth-tone colors serve as camouflage as they take shelter in the rocks. Eagles and some other birds of prey use cliff caves as nesting and resting sites. Their ability to fly to great heights gives them an advantage as they search for food when prey is scarce.

For humans, steep mountain slopes and the harsh winters make activities like farming and traveling difficult. While mountains are sparsely populated, humans do use resources from the mountains. Forestry and mining are major industries, and mountains provide a great deal of the water used by humans.



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Key Vocabulary

Elevation: Height above the ground.

Hibernate: To pass winter in a state of deep rest.

Peak: The pointed summit of a mountain.

Tree line: The elevation above which trees do not grow.

Toolbox



Summary of Activities

Students study pictures of mountain animals and paste animal cutouts at different elevations of a mountain. They help develop a concept map about a mountain ecosystem and gather information to determine if their community is on or near a mountain.



Instructional Support

See Unit Resources, pages 20-21

Prerequisite Knowledge



- Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say.
- Students must be able to speak clearly enough to be understood by others.
- Students need to understand simple oral directions and be able to gather information from pictures.

Advanced Preparation



Make copies:

Make copies as indicated in the Activity Masters section below.

Cut out animals:

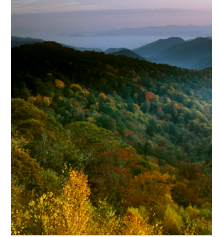
Cut out the line drawings of animals provided as an Activity Master (see below).

Draw mountain outline:

Draw the outline of a mountain on a large sheet of chart paper and mount this on the wall.

Prepare Visual Aids:

Produce materials as indicated in the Visual Aids section.



Materials Needed



E Is for Earth books:

From Lesson 1

Class Supplies:

Chart paper, crayons or colored pencils, glue, markers, pencils

Activitiy Masters:

See below

Visual Aids



Big Book:

The World Around Me

Map:

Relief Map of California, page 93

Photo cards:

Mountain animals, pages 99-103

Duration



Preparation time:

10-15 min.

Instructional time:

55-60 min.



Safety Notes

None

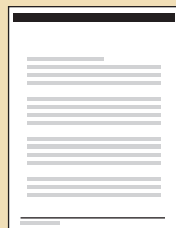
Activity Masters



What Animal Is This?

Page 85

One per student



Mountain Cutouts

Page 86

One per class



Mountain Assessment Checklist

Page 88

One per class

Procedures

Step 1

Show the students the “M Is for Mountain” page in *The World Around Me* (Lesson 1 Visual Aid). Introduce the terms “peak,” “tree line,” and “elevation” in discussing some of the features of mountain ecosystems. Write these words on the board and add simple line drawings to illustrate what they mean. To help students understand the word “elevation,” tell students that the ceiling is at a higher elevation than the floor. Encourage them to come up with additional sentences about different elevations (for example, my head is at a higher elevation than my feet). Draw students’ attention to different features of a mountain at different elevations (snow, tree line).

Step 2

Point out the animals shown on the page and draw students’ attention to where they live. Share additional information about specific animals provided in the lesson background. For example, tell students about bears hibernating, eagles flying high to hunt for food below, mountain hares changing color in winter. Point out the human activities—logging and berry-picking—depicted in the picture. Ask, “What do people get from mountains that helps them survive?” (*Wood, food, water*)

Step 3

Pair students and give each pair a photo card and a cutout of an animal that lives on the mountain. After they study the picture, have them name and describe the animal and what it uses for shelter or where it builds a home (cave, tree, ground, and so on). Write the name of each animal on the board. (*Students will need the names for completing written work in the next part of the lesson.*) Have students identify one of the challenges their animal faces living on a mountain and at least one of the resources it uses to meet its basic needs (food, water, shelter). Have the students glue their cutout of the animal on the outline of a mountain you have drawn on butcher or chart paper. They should place their cutout according to the elevation (top, middle, bottom) or habitat where they think the animal might live most of the time.

Step 4

Distribute the *What Animal Is This?* (Lesson 3 Activity Master) worksheet. Students complete this worksheet by writing their names at the top and finishing three sentences about the animal depicted on their photo card. Call attention to the names of the animals listed on the board to help students with spelling. Encourage students to use “invented spellings” of words not on the board. As students finish, have them raise their hands. Listen to each student read what he or she has written on the worksheet. As students wait for others to finish, have them draw a picture of their animal and its nest or where it goes for shelter. Students should use the back of their worksheet to draw their pictures. They can share their drawings with each other.



Step 5

Use the students' ideas to develop a concept map depicting some of the parts and connections of a mountain ecosystem. (See the example in *The World Around Me - Part 2.*) The following are questions that can be used to elicit student contributions to the concept map:

- What are some words you could use to describe a mountain? (*High elevation, peaked, water source, snowy, other answers.*)
- Where do some animals get shelter on the mountain? (*In underground tunnels, in rocks and caves.*)
- Where do they go for food? (*They search for food in the rocks, and plants above and below the tree line.*)
- How are parts of the mountain ecosystem connected? (*Predator/prey relationships; water; plants as food and shelter for animals.*)

Step 6

Examine the **Relief Map of California** (Lesson 2 Visual Aid) and have students identify the mountains closest to their city or town. Have students describe the pattern of the mountains in the state. Use leading questions to stimulate a discussion about the natural resources people get from the mountains to use in everyday life (food, water, air, wood, paper):

- What do you use in everyday life that might have come from a mountain or from the parts of the mountain ecosystem? (*Rocks; water; animals; products from trees and other plants, such as wood, paper, berries.*)
- How does what you know about rivers relate to what you now know about mountains? (*Water in rivers may come from snow melting in the mountains as the weather becomes warmer in the spring and summer.*)

Step 7

Return students' individual *E Is for Earth* (Lesson 1 Activity Master) books. Have them turn to the mountain page and add (by drawing) some parts of a mountain ecosystem (for example, plants, animals, rocks, snow/water). Give them time to talk about their drawings, encouraging them to speak in complete, coherent sentences. Collect the books when students have completed their work.

Lesson Assessment

Instructions

Description:

Student assessment for this lesson is embedded throughout the procedures. Embedded assessment activities consist primarily of inquiry questions related to the EEI Learning Objectives. All students should participate in the discussion, and their individual responses should be evaluated for accuracy. Students should be asked to explain some of their ideas to check for any misconceptions.

Instructions:

Have students complete the following, one-on-one with the teacher or another adult prepared to assess students' responses and provide feedback:

1. Describe an animal that lives on the mountain. Match the animal to the habitat where it might be found.
2. Name one resource found on a mountain that an animal could use to meet its basic needs.
3. How are conditions on the mountain different in summer and winter? How would these differences affect animals?
4. What resources from the mountain do humans use in everyday life?

Suggested Scoring

Use the **Mountain Assessment Checklist** (Lesson 3 Activity Master) to record students' performance.

Mountain Assessment Checklist (Lesson 3 Activity Master)

Student's Name	Can describe a mountain animal, plant or habitat	Can identify how a mountain- dwelling animal's needs are met	Can identify how parts of a mountain ecosystem are connected	Can identify how mountain resources are used by people	Can use vocabulary words in meaningful context
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Lesson 4



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V Is for Valley

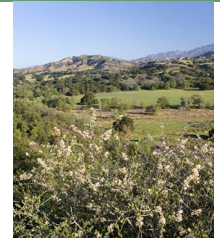
This lesson focuses on valleys as one ecosystem in California. Students learn about the characteristics of a valley and how these characteristics make it suitable for the human system of agriculture. They see that the shape of the land and access to water provide ideal conditions for humans to grow crops and raise animals.

The concept of connectors within and between ecosystems is also reinforced as students revisit the story of snow melting in the mountains to contribute to the rivers flowing to the valley. Students also become familiar with the diversity of plants and ani-

mals that thrive in a **valley** ecosystem and the parts within the system that help them survive.

English-Language Arts skills supported through this lesson include sharing information and ideas, following directions, and describ-

ing places and things. Ways in which students are actively involved include developing a definition of a valley, participating in creating a concept map, and studying a relief map of California.



Background

A valley is lowland surrounded by hills or mountains. Some valleys are narrow; others quite wide. Narrow valleys generally get less sunshine and are cooler than wide valleys. Valleys in California, east of the coastal mountains, get a lot of sunshine but are cooled by fog. This cooling allows grapes to be cultivated. Fruit and nut trees and cool weather vegetables are grown in the coastal valleys.

A wide variety of trees, shrubs, wildflowers, mammals, birds, reptiles, and amphibians can be found in the valleys of California. Valleys have many natural components that help plants and animals thrive. The flat terrain of the valley floor contrasts with the steep, rocky terrain of the mountains that often surround a valley. Centuries of weathering and erosion in the mountain have produced fertile alluvial fans on the floors of the valleys, where the soil is ideal for raising crops (fruits, vegetables, nuts, and grains) and growing the grasses necessary for grazing cattle. The fruits, nuts, and vegetables grown in valley farms are not native to the area, but the valley ecosystem's components (rich soil, water) produce bumper crops. California communities and the state's economy depend on these farms and their crops.

California's Great Central Valley stretches nearly 400 miles north to south. It is home to many of the world's most productive agricultural

Learning Objective

List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area.

Name some of the plants and animals that live in their local area.

Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing).

efforts. The Central Valley is hot and dry during summer and cold and damp in winter. The Salinas Valley is sometimes called "America's Salad Bowl" because of the wide variety of vegetable crops grown there, including salad greens, tomatoes, and artichokes.

Rivers and river tributaries flow through most of California's valleys. Other valleys, such as Death Valley, are part of a desert where the water is far underground in an aquifer (addressed in Lesson 5). Water, which serves as a connector for all ecosystems, determines the health of the valley ecosystem, just as it determines the health of the rivers and mountains from which that water comes.



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Key Vocabulary

Valley: A long and mostly level lowland between ranges of mountains or hills.

Toolbox



Summary of Activities

Students define “valley” and identify why a valley is suitable for growing crops. They help develop a concept map and identify one way their daily life relates to valley resources. They gather information to determine if their school is in a valley.



Instructional Support

See Unit Resources, pages 20-21

Prerequisite Knowledge



- Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say.
- Students must be able to speak clearly enough to be understood by others.
- Students need to understand simple oral directions and be able to gather information from pictures.

Advanced Preparation

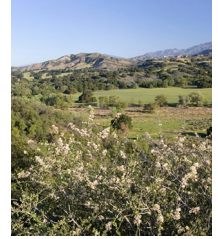


Collect examples:

Gather some fruits, nuts, and vegetables grown in the Central and Salinas Valleys or cut pictures of the products from supermarket ads.

Prepare Visual Aids:

Produce materials as indicated in the Visual Aids section.



Materials Needed



Dictionary:
One per class

Examples of valley products:
Collection of fruits, nuts, and vegetables grown in the Central and Salinas Valleys (or pictures cut from supermarket ads)

E Is for Earth books:
From Lesson 1

Class Supplies:
Chart paper, crayons or colored pencils, marker, pencils

Visual Aids



Big Book:
The World Around Me

Map:
Relief Map of California, page 93

Photo cards:
Mountain animals, page 99-103

Duration



Preparation time:
5-10 min.
Instructional time:
45-55 min.



Safety Notes

Check for food allergies before bringing food or nuts into the classroom.

Activity Masters



Valley Assessment Checklist
Page 89
One per class

Procedures

Step 1

Show students the picture of the valley in *The World Around Me* (Lesson 1 Visual Aid). Have students describe the valley. (*It is mostly flat; it gets water from the mountains; different kinds of animals and plants grow there; other answers.*) Ask students to identify and describe some of the animals that live in the valley. (*Squirrels, birds, butterflies, other insects.*) Ask students to think about and share their ideas about what these animals eat and where they build their nests and go for protection. (*They eat nuts, nectar, grass, and so on; they build their nests in burrows and trees.*) Remind students that animals can survive in a valley only if all their basic needs can be met there.

Step 2

Using the **Relief Map of California** (Lesson 2 Visual Aid), have students identify the location of the two major mountain ranges: the Sierra Nevada and the Coast Ranges. Point out the land between the mountain ranges, where the San Joaquin and the Salinas Rivers flow. Tell students that area is called a valley. Write the sentence stem, “A valley is ...” on the board. Ask students for ideas on how to finish the sentence. Write their ideas on the board. Look up the definition of “valley” in a dictionary and compare the definitions suggested by the students to the one in the dictionary.

Step 3

Point out the location of California’s Great Central Valley and the Salinas Valley on the **Relief Map of California**. Tell students that some people call the Salinas Valley “America’s Salad Bowl.” Ask them why this name might fit this area. After the students have suggested that “it looks like a bowl,” tell students that valleys are places that have many things plants need to grow. Have students name what those things might be. (*Water, sun, soil.*) Explain that valleys like the Central Valley get a lot of sun most of the year; unlike the mountain ecosystem, the valley rarely has snow or ice, which would make it hard for plants to live. Water from the rivers that begin in the mountains makes its way into the valleys. Rocks and minerals follow the water or move down into the valleys from the mountains, making the soil very good for plants. Ask students, “Given all these parts of the valley ecosystem, why would people like living in the valleys?” (*They can grow food there; there are many plants and animals there; there is water, but not a lot of snow there.*)



Step 4

Tell students that many farms are located in California's Great Central Valley. Display and name some of the vegetables grown in the valley, or provide pictures depicting those vegetables cut from newspaper ads. Tell students that fruits and nuts are grown in the Central Valley. Name and display a few examples, such as pistachios, oranges, and apples. Have students name at least one thing they ate in the last day or two that might have come from California's Central Valley.

Step 5

Explain that not all valleys are used for growing crops. Show them the pictures of a valley in *The World Around Me - Part 2* where cattle are grazing and a valley in which a city is located. Have the students explain why valleys are generally good places for raising livestock such as cows, sheep, goats, and horses. (*There are many plants to eat; water is plentiful; the land is flat; the weather is warm, there is little snow.*) Using the **Relief Map of California**, have students identify their own community on the map and determine whether it is located in a valley.

Step 6

Using the students' ideas, develop a valley concept map depicting some of the parts and connections within a valley ecosystem. (See the example in *The World Around Me - Part 2*.) Use leading questions to stimulate a discussion about some of the natural resources people get from a valley for use in everyday life (food, water):

- Can you think of one thing you use everyday that might have come from a valley? (*Air, water, food.*)
- Think of three salad foods you could get from a valley. (*Lettuce, tomatoes, artichokes, other answers.*)
- What is your favorite fruit that is grown in a valley? (*Answers will vary.*)

Step 7

Return students' individual *E Is for Earth* (Lesson 1 Activity Master) books. Have them turn to the valley page and add (by drawing) some parts of a valley ecosystem (for example, plants, animals, water, soil). Give them time to explain their drawings, encouraging them to speak in complete coherent sentences. Collect the books when students have completed their work.

Lesson Assessment

Instructions

Description:

Student assessment for this lesson is embedded throughout the procedures. Embedded assessment activities consist primarily of inquiry questions related to the EEI Learning Objectives. All students should participate in the discussion, and their individual responses should be evaluated for accuracy. Students should be asked to explain some of their ideas to check for any misconceptions.

Instructions:

Have students discuss their understanding of the following with the teacher or another adult prepared to assess students' responses and provide feedback:

1. Describe the characteristics of a valley.
2. Identify some of the animals that live in a valley.
3. Identify at least one resource found in a valley that an animal could use to meet its basic needs.
4. Identify resources from a valley that humans use for farming and in other ways.

Suggested Scoring

Use the Valley Assessment Checklist (Lesson 4 Activity Master) to record students' performance.

Valley Assessment Checklist (Lesson 4 Activity Master)

[illegible]

Lesson 5



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D Is for Desert

In this lesson, students learn about the desert as one ecosystem in California. They also learn about features and behaviors of different plants and animals that live in the desert. This lesson reinforces the concepts of habitat and how animals depend on the natural system for resources to meet their basic needs (water, food, and shelter).

This lesson also reinforces the concept of the connectors between parts of an ecosystem and between one ecosystem and other ecosystems. Students also learn how humans use resources from the desert to support their daily lives. Sand and rock

garnered through mining are used as examples of desert resources.

Students are actively engaged in analyzing visuals, helping develop a concept map, and working on their ***E Is for Earth*** books. English-Language Arts skills supported through

this lesson include sharing information and ideas, following directions, describing places and things, following words from left to right and from top to bottom, and writing upper case and lower case letters of the alphabet.



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Background

California is home to Death Valley, one of the most famous deserts in the world. Death Valley National Park is over 3.3 million acres in size and includes the lowest, hottest, driest location in North America, with almost 550 square miles lying below sea level.

The living things in a desert ecosystem must be able to meet their needs in a dry environment. Some plants, like cacti, store water in their roots and stems. Other desert plants have long taproots that penetrate the water table, anchor the soil, and control erosion. The taproot systems of creosote bushes, mesquite, and some other plants can extend 50 feet down to a year-round supply of **groundwa-**

ter. Aquifers are natural reservoirs of water under the ground. If some of this water reaches the surface, a pool forms. Trees and other plants grow around the pool.

Few large mammals live in California's deserts, those that do, like the kit fox and bighorn sheep, have adapted means to meet their water needs and find shelter from the sun. Some smaller mammals have adapted quite well to the dry environment. Antelope jackrabbits eat desert grasses, prickly pears, and other plants. During the hottest part of the day, they rest in shallow holes in the ground or beneath shady plants. Their ears release heat when it is hot. The kangaroo rat is able to metabolize the dry seeds it



eats to produce water. Many desert animals move around and meet their needs at night, when the desert is cooler.

Mining is one of the ways people use the natural resources from the desert. Sand, rock, salt, and various other minerals are some of the things mined from the desert. People use these resources in constructing buildings and roads, making jewelry, and producing a variety of metal products for homes and industry.

Learning Objective

List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area.

Name some of the plants and animals that live in their local area.

Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing).



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Key Vocabulary

Groundwater: Water below the surface of the ground that sometimes supplies water to wells and springs.

Mining: The act of extracting minerals from Earth.

Toolbox



Summary of Activities

Students identify some of the challenges plants and animals have living in a desert and discuss how their basic needs are met. They also identify some ways humans benefit from resources found in a desert. They gather information to determine if their school is in a desert.



Instructional Support

See Unit Resources, pages 20-21

Prerequisite Knowledge



- Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say.
- Students must be able to speak clearly enough to be understood by others.
- Students need to understand simple oral directions and be able to gather information from pictures.

Advanced Preparation



Prepare Visual Aids:

Produce materials as indicated in the Visual Aids section.



Materials Needed



E Is for Earth books:

From Lesson 1

Class Supplies:

Crayons or colored pencils, pencils

Visual Aids



Big Book:

The World Around Me

Photo cards:

Desert plants and Animals,
pages 104-107

Duration



Preparation time:

5-10 min.

Instructional time:

50-60 min.



Safety Notes

None

Activity Masters



Desert Assessment Checklist

Page 90

One per class

Procedures

Step 1

Show students the picture of a desert in *The World Around Me* (Lesson 1 Visual Aid). Ask them to describe a desert based on what they see. Encourage them to speak in complete, coherent sentences. Help students develop a description of a desert as a place that is dry, often sandy, and with fewer plants than the mountain, valley, and river ecosystems. While still looking at the picture of the desert, have students identify some of the challenges living things have in meeting their needs in the desert. (*Dryness; extreme heat at some times and extreme cold at other times; limited vegetation for shade and food; limited water.*)

Step 2

Show individual photo cards of a kangaroo rat and an antelope jackrabbit. Have the students identify some of the characteristics of these two animals. Add more information about these animals by sharing the descriptions printed on the backs of the photo cards. Also explain how they adapt to the dry conditions of the desert. (*See information on back of photo cards.*)

Step 3

Show students the photo card of a creosote bush. Ask them what this bush needs to stay alive. (*Food, water, sunlight.*) Share the description printed on the back of the photo card. Also explain how the creosote bush can survive in the dry conditions of the desert.

Step 4

Encourage students to imagine themselves as a creosote bush in the desert. They cannot move to get water, and it does not rain much in the desert. What else could they do to get water? After some discussion, tell them about the special taproot the bush has and how it reaches down to the groundwater below the surface. On the board, make a line drawing of groundwater far below the surface of the ground.

Step 5

Ask the students to think about where the groundwater in a desert comes from. They may talk about melting snow and water moving through rivers, but explain that not all of the water from melting snow and rain enters a river. Some water branches off into smaller streams and creeks. Some of it flows into lakes and ponds. Some of the water sinks into the ground or runs down through cracks in the ground. This water becomes groundwater.



Step 6

Explain that there is a lot of water under the ground in a desert and in other places. Sometimes, it flows like rivers and streams; other times it stays in one place like water in a sponge. This kind of underground storage for water is called an aquifer. The water in an aquifer is stored in layers of earth, gravel, or stone far below the surface. Because the water under a desert is far below the surface, we would have to dig a very long time to reach it. Explain that if we started digging, we would find other useful things before we reach the water. Show students the picture of the desert in *The World Around Me* and point out the truck carrying loads of sand and stone from a quarry. Introduce the word “mining.” Invite students to share what they know about the resources people get from deserts. (*Sand, stone, minerals.*)

Step 7

Use the students’ ideas to develop a concept map depicting some of the parts and connectors in a desert ecosystem. (*See the example in The World Around Me - Part 2.*) Use leading questions to stimulate student contributions:

- What are some words you could use to describe a desert? (*Dry; sometimes sandy or rocky; extreme heat in the day and extreme cold at night; few plants.*)
- Where do some animals get shelter in the desert? (*In holes in the ground; beneath shady plants.*)
- Where do they go for food? (*They eat desert plants and seeds, or other desert animals.*)
- How are parts of the desert ecosystem connected? (*Predator/prey relationships; water; plants as food and shelter for animals; other answers.*)

Step 8

Return students’ individual *E Is for Earth* (Lesson 1 Activity Master) books. Have them turn to the desert page and add (by drawing) some parts of a desert ecosystem (e.g., plants, animals, groundwater, sand, stone). Collect the books when students have completed their work.

Lesson Assessment

Instructions

Description:

Student assessment for this lesson is performance-based and is embedded throughout the procedures. The embedded assessment consists primarily of inquiry questions related to the EEI Learning Objectives. All students should participate in the discussion, and their individual responses should be evaluated for accuracy. Students should be asked to explain some of their ideas to check for any misconceptions. Further student assessment occurs as they complete their drawings in their individual books.

Instructions:

Have students individually discuss the following with the teacher or another adult prepared to assess students' responses and provide feedback:

1. Describe the major characteristics of a desert ecosystem.
2. What challenges do plants and animals face if they are to survive in a desert?
3. What resources from the desert do humans use?
4. Is our school in a desert?

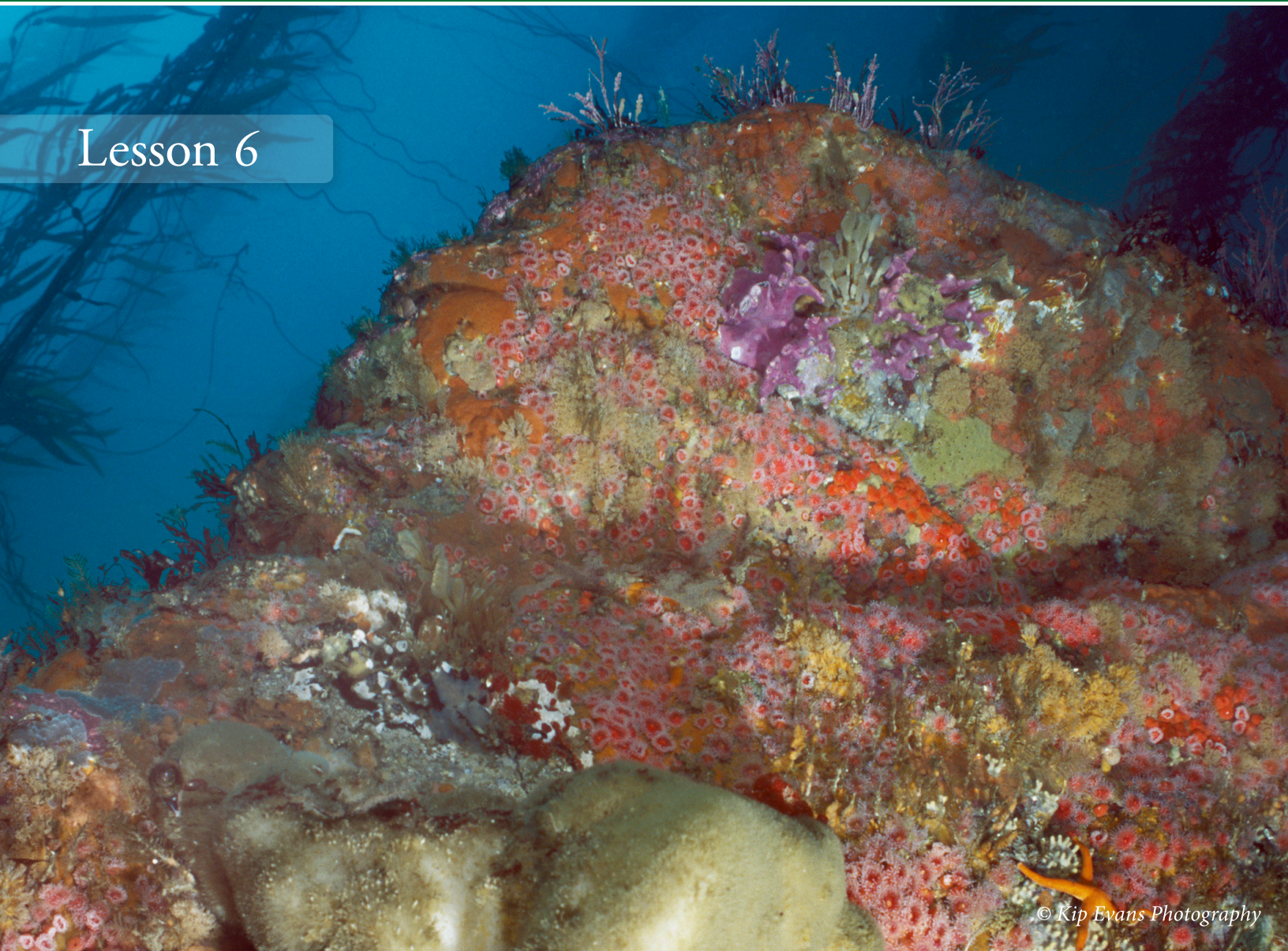
Suggested Scoring

Use the **Desert Assessment Checklist** (Lesson 5 Activity Master) to record students' performance.

Desert Assessment Checklist (Lesson 5 Activity Master)

[illegible]

Lesson 6



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O Is for Ocean

In this lesson, students learn how the watery habitat of an ocean is different from other habitats with water. Students also learn how the plants and animals that live in the ocean meet their needs in this type of environment. The lesson reinforces the concepts of habitat and ecosystems as well as the idea that a habitat provides living things with what they need to survive.

This lesson also helps students understand that some of human basic needs are met through resources obtained from the ocean. By studying a map of California, students discover that many major cities are located

near an ocean. Other activities, including the development of a concept map, reinforce the idea of the ocean as an important resource for humans.

English-Language Arts skills supported through this lesson include

speaking audibly in coherent sentences to share information and ideas, using phonetically spelled words to write about people and objects, and following directions.

Learning Objective

List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area.

Name some of the plants and animals that live in their local area.

Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing).



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like all animals that live on land, depend on their environment to meet their basic needs for survival—food, water (in this case to breathe and drink), and shelter.

Kelp is the world's longest algae. Kelp stems are anchored to the ocean floor with powerful roots called holdfasts. Kelp leaves reach upward to catch sunlight that penetrates the water. A kelp forest is home to many animals and thus helps them to survive. Kelp beds act as nurseries for the eggs of fish, jellyfish, sea urchins, crabs, and other creatures. Kelp is harvested for some food and other products used by humans (including ice cream and toothpaste).

People are drawn to the water. Many people vacation near the ocean and approximately 60 percent of the global population lives within 40 miles of the sea. Human activities such as fishing and shipping take advantage of the ocean's natural resources. Other ocean products used by humans include sea salt, minerals, sponges, and selected parts of plants and animals used to make medicines, paints, and fertilizers.

Background

California's longest border is with the Pacific Ocean. Not all oceans are the same, nor are all parts within an ocean the same. The ocean ecosystem is actually made up of many different habitats. Coral reefs are one type of **habitat** within the Pacific Ocean, but California does not have any coral reefs in its ocean ecosystem because the water is not warm enough. It does have reefs made of other materials,

providing habitat for many animals and plants.

Animals living in the ocean have many challenges; they must be adapted to ocean conditions. Most ocean life exists in the top 300 feet of water, where there is at least some sunlight. Other animals do live in the lower layers of the ocean, and some live on the ocean floor. Some animals live both in the ocean and on the shore. All animals that live in the ocean,



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Key Vocabulary

Current: A band of water or air that flows in one direction without stopping

Habitat: The place where a living thing lives and meets its basic needs

Kelp: Any of the large seaweeds that grow in the ocean.

Toolbox



Summary of Activities

Students study a California map to identify where rivers enter the sea and locate major cities. They view photos of an underwater area, help develop a concept map, create an ocean mural, and gather information to determine whether they live near the ocean.



Instructional Support

See Unit Resources, page 20-21

Prerequisite Knowledge



- Students should be able to participate in a group discussion by relating comments to the discussion topic and listening to what others say.
- Students must be able to speak clearly enough to be understood by others.
- Students need to understand simple oral directions and be able to gather information from pictures.

Advanced Preparation



Prepare Visual Aids:

Produce materials as indicated in the Visual Aids section.

Create ocean mural:

Make and display the background for a large ocean mural (about 5 feet by 5 feet) on the wall of the classroom. Use different shades of blue to represent different water depths. This can be made by painting white paper or using different shades of blue paper. Do not add fish, rocks, kelp, or other elements since the students will be adding these.



Materials Needed



E Is for Earth books:

From Lesson 1

Class Supplies:

Blank paper, crayons, glue, scissors

Visual Aids



Big Book:

The World Around Me

Map:

Relief Map of California, page 93

Duration



Preparation time:

30 min.

Instructional time:

40-45 min.



Safety Notes

The scissors should be student scissors and students should be reminded how to handle them safely.

Activity Masters



Ocean Assessment Checklist

Page 91

One per class

Procedures

Step 1

Have students study the **Relief Map of California** (Lesson 2 Visual Aid). Identify the path of water from three major rivers flowing into the sea (i.e. Sacramento—San Joaquin Delta and San Diego River—Pacific Ocean. Trace with a finger (on the map) the flow of water from the melting snow of the mountains to where it enters the sea. Tell the students that once the water from a river enters the ocean, it moves into a very different environment. Most of the animals and plants that live in the water of a river cannot live in the water of the ocean; a very few, such as salmon and some sharks, can live in both ecosystems.

Step 2

Show students the “O Is for Ocean” page in *The World Around Me* (Lesson 1 Visual Aid). Have students describe what they see and what they know about the ocean. Encourage them to speak in complete coherent sentences. Write their descriptive words (salty, deep, whales, sharks, tides, waves, and so on) on the board. Introduce the following ideas as appropriate during the discussion: it is dark and cold in deep water, the ocean has bands of moving water called currents; kelp is the world’s longest algae with roots anchored to the ocean floor and leaves reaching upward to catch sunlight that penetrates the water; reefs—strips or ridges of rocks or sand near or above the surface of the water.

Step 3

Redirect students’ attention to the **Relief Map of California** (Lesson 2 Visual Aid) and identify five major cities—Sacramento, San Diego, San Francisco, Los Angeles, and Santa Barbara. Ask students if they live in or near one of these cities. Ask the students what they notice about where these cities are located. (*All but one, Sacramento, are located on or near the ocean.*) Ask students why they think so many big cities are by the ocean. (*People enjoy the ocean; people have jobs associated with the ocean, such as commercial fishing, shipping, and tourism; getting goods from other places is easy because they can be brought in by ship.*) Ask if students know anyone who works in an ocean-related job.



Step 4

Lead the students in a discussion about how parts of the ocean ecosystem are connected and how humans benefit from this ecosystem. From this discussion, develop an ocean concept map depicting some of the parts and connections of an ocean ecosystem. (See the example in *The World Around Me - Part 2*.) Be sure to include connections to humans and how humans use resources from the ocean. Use leading questions to stimulate student contributions:

- Do you see any animals in the kelp forest?
- What other animals do you see? What do you think they eat?
- Do we eat anything that comes from the ocean?
- Do you know of anything else people use from the ocean?

Step 5

Return students' individual *E Is for Earth* (Lesson 1 Activity Master) books. Have them turn to the ocean page and draw some parts of an ocean ecosystem (for example, fish, whales, seaweed, crabs, kelp). Have each student choose one thing drawn in the *E Is for Earth* book that he or she would like to add to the ocean mural on the wall. Have students draw the selected items on sheets of paper and then cut them out and paste them on the large ocean mural posted on the wall. Refer to what they drew as different parts of the ocean ecosystem. Have each student describe a connection between what they drew and some other part of the ocean ecosystem. Encourage them to speak in complete and coherent sentences.

Lesson Assessment

Instructions

Description:

Student assessment for this lesson is performance-based and is embedded throughout the procedures. The embedded assessment consists primarily of inquiry questions related to the EEI Learning Objectives. All students should participate in the discussion, and their individual responses should be evaluated for accuracy. Students should be asked to explain some of their ideas to check for any misconceptions.

Instructions:

Have students discuss the following one-on-one with the teacher or another adult prepared to assess students' responses and provide feedback:

1. Describe the major characteristics of an ocean ecosystem.
2. Identify some of the challenges living things face in an ocean.
3. Identify ways in which animals meet their basic needs in an ocean ecosystem.
4. Identify resources humans use from oceans.

Suggested Scoring

Use the **Ocean Assessment Checklist** (Lesson 6 Activity Master) to record students' performance.

Ocean Assessment Checklist (Lesson 6 Activity Master)

[illegible]

Unit Activity Masters

Unit Assessment

The World Around Me

Unit
Assessment

Page 72

Unit
Assessment
Scoring
Checklist

Page 75

Lesson 1

E Is for Earth

E Is for Earth

Page 76

Ecosystems
Assessment
Checklist

Page 82

Lesson 2

R Is for River

River Boat
Tickets

Page 83

River
Assessment
Checklist

Page 84

Lesson 3

M Is for Mountain

What
Animal Is
This?

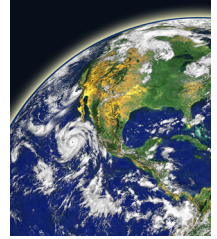
Page 85

Mountain
Cutouts

Page 86

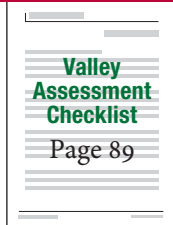
Mountain
Assessment
Checklist

Page 88



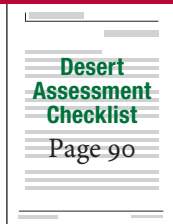
Lesson 4

V Is for
Valley



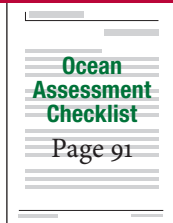
Lesson 5

D Is for
Desert



Lesson 6

O Is for
Ocean



Unit Assessment - Part 1 (Activity Master)

Name _____

Where Could an Animal Live?



Unit Assessment - Part 2 (Activity Master)

Name _____

Who Lives Here?

Plant	Animal

Unit Assessment - Part 3 (Activity Master)

Name _____

What Resources do I Use?

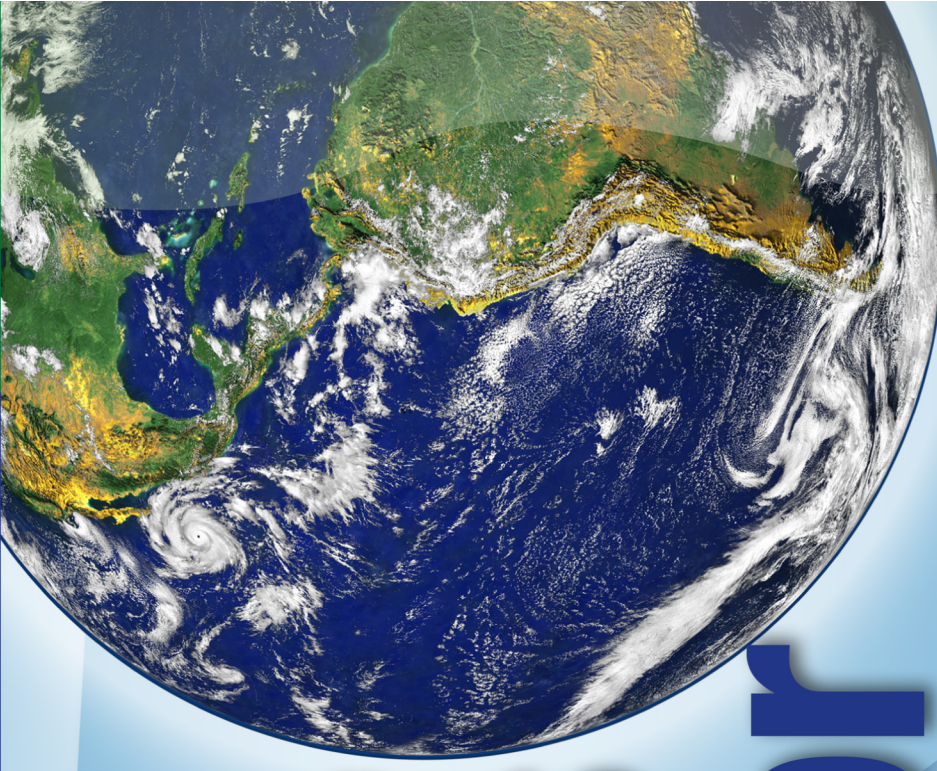
1. _____

2. _____

3. _____

Unit Assessment Scoring Checklist (Activity Master)

Student's Name		Comments
Names plants in local area	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	
Names animals in local area	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	
Identifies river habitats	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	
Identifies mountain habitats	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	
Identifies valley habitats	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	
Identifies desert habitats	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	
Identifies ocean habitats	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	
Identifies resources people use in everyday life	<input type="checkbox"/> Mastered <input type="checkbox"/> In Progress <input type="checkbox"/> Not Demonstrated	



EEI for Earth

This book belongs to:

Unit Title
The World Around Me

Grade
Kindergarten

Discipline
Science

Standard Number
K.3.a.

Supporting Strand Name
Listening and Speaking

Standard Number(s)
K.1.2. and K.2.1.

Prepared by
Ruth Wilson



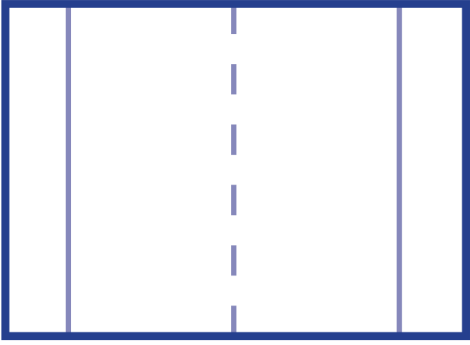
California Education and the Environment Initiative

<http://www.calepa.ca.gov/Education/EEI/>

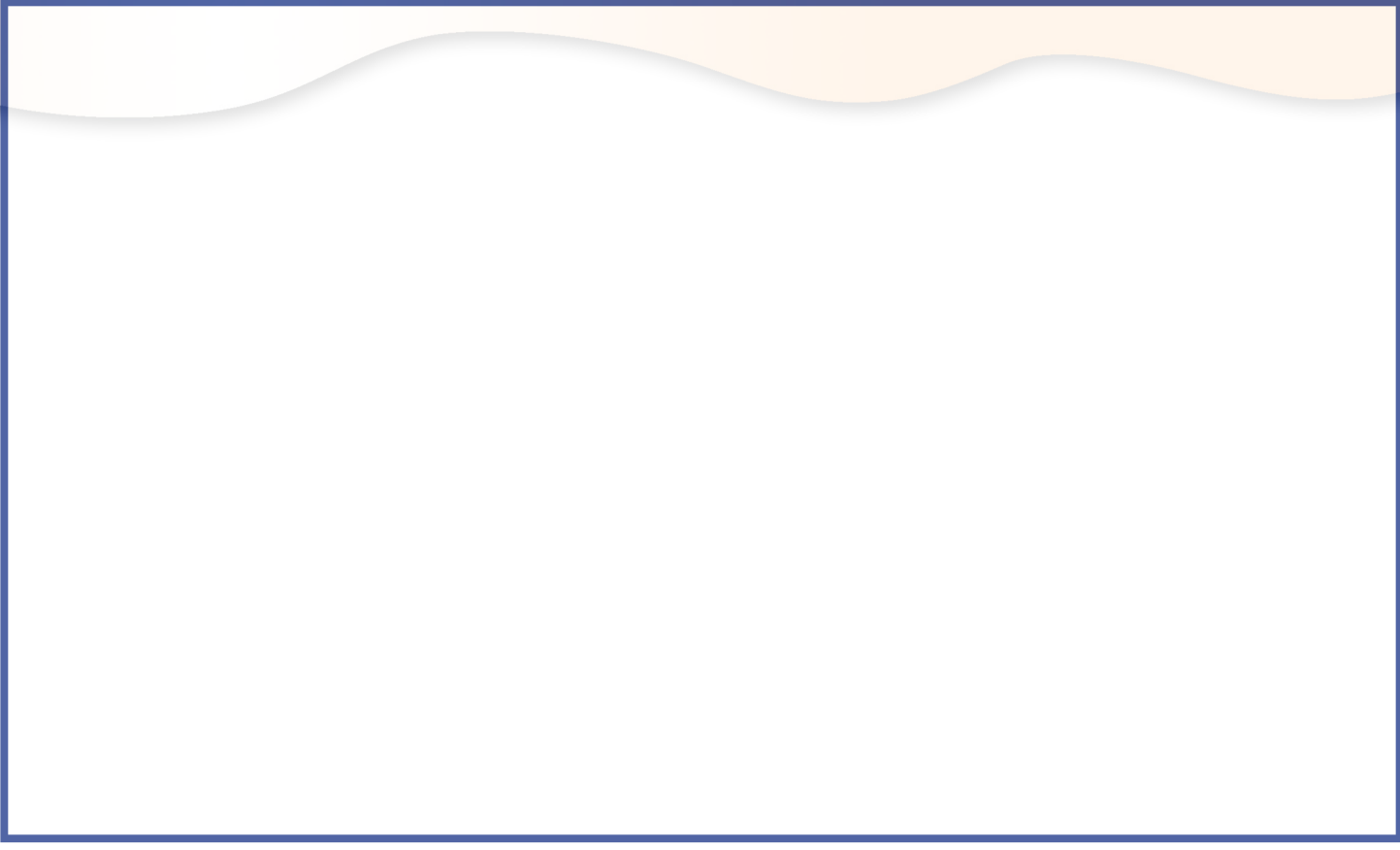
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Is for
Mountain







Desert





Ecosystem Assessment Checklist (Lesson 1 Activity Master)

[illegible]

River Boat Tickets (Lesson 2 Activity Master)

**River Boat
Ticket**

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River Assessment Checklist (Lesson 2 Activity Master)

[illegible]

What Animal Is This? (Lesson 3 Activity Master)

Name _____

My animal is a _____**It has** _____

Its home is in _____

Mountain Cutouts (Lesson 3 Activity Master)



Mountain Cutouts (Lesson 3 Activity Master)



Mountain Assessment Checklist (Lesson 3 Activity Master)

[illegible]

Valley Assessment Checklist (Lesson 4 Activity Master)

[illegible]

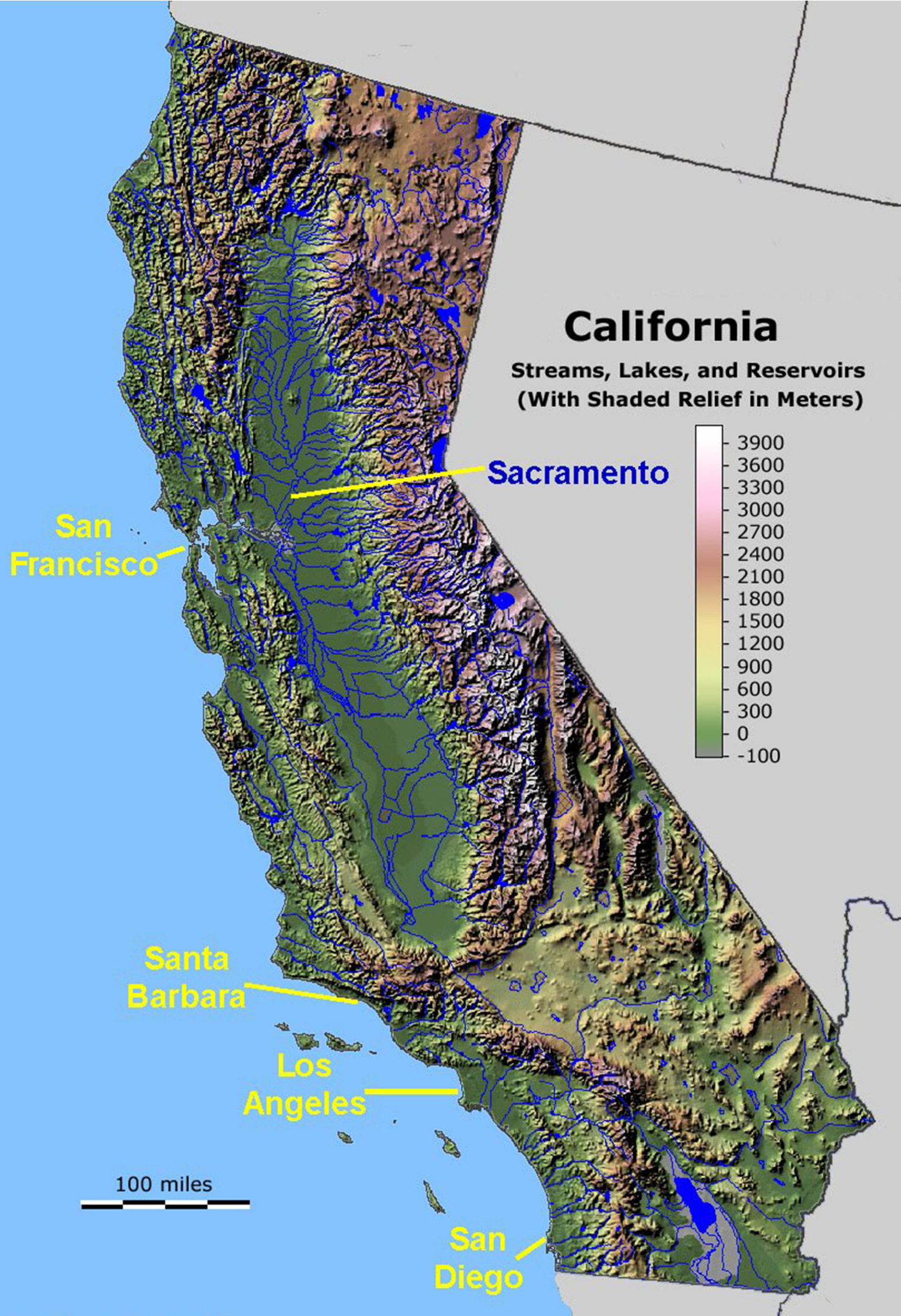
Desert Assessment Checklist (Lesson 5 Activity Master)

[illegible]

Ocean Assessment Checklist (Lesson 6 Activity Master)

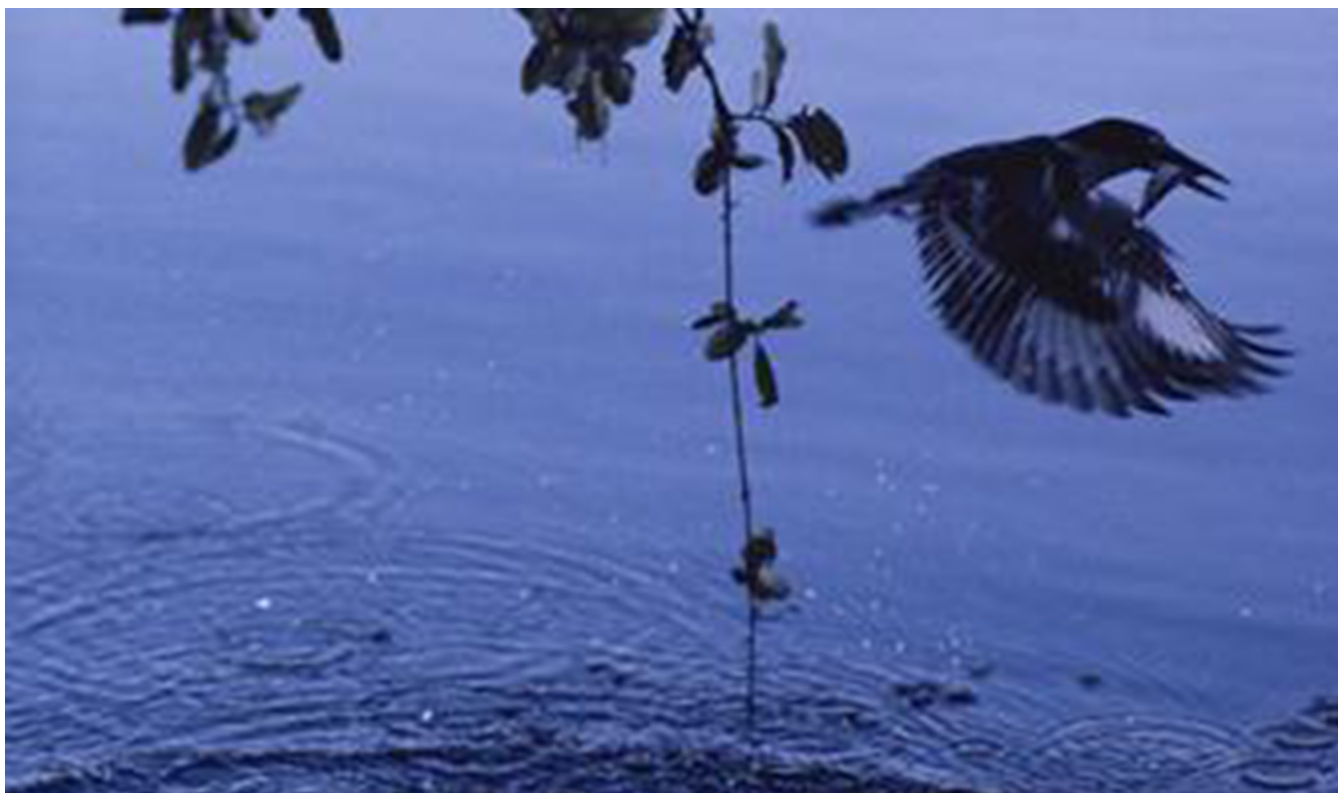
[illegible]

Unit Visual Aids



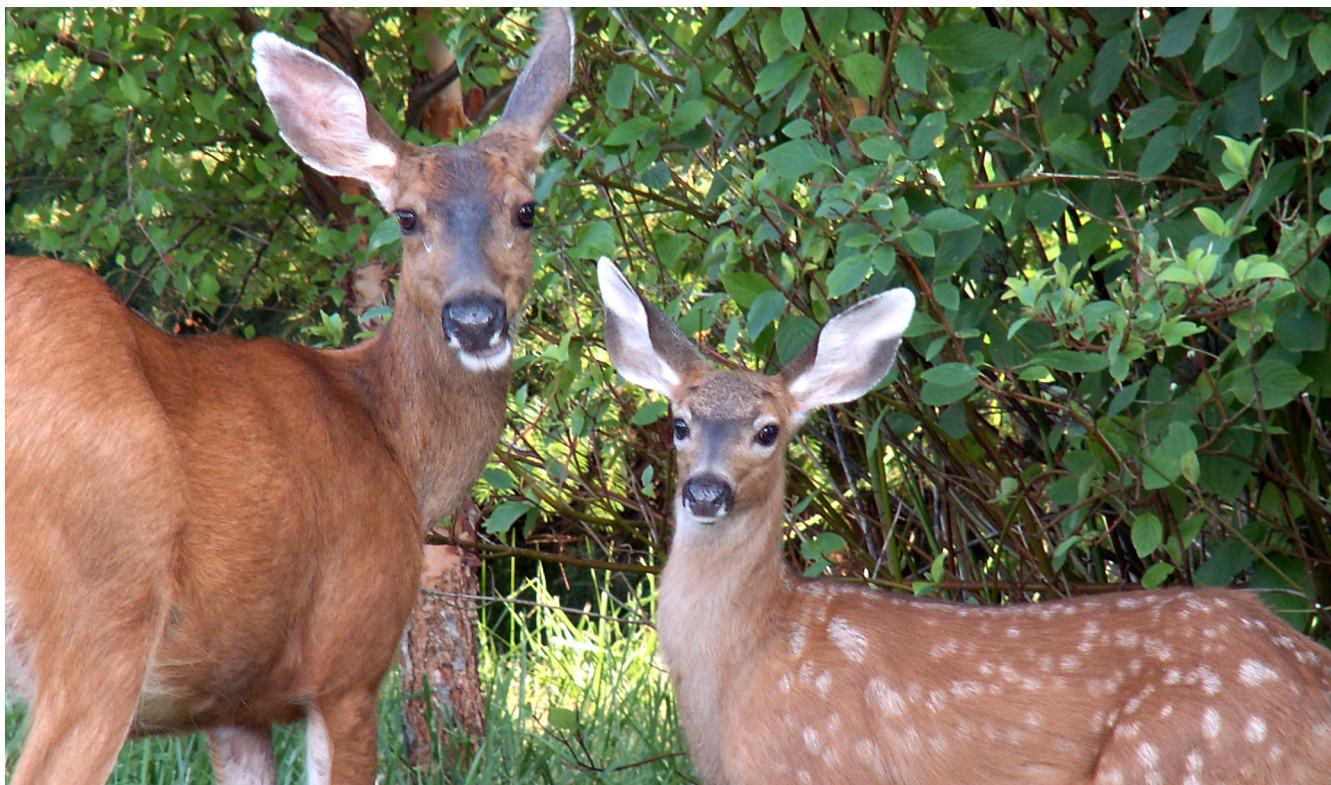




















The California desert tortoise is a land-dwelling turtle. Their legs are thick and covered with skin that feels hard to the touch. Adult desert tortoises can grow to 15 inches in length. Unlike water turtles desert tortoises do not swim. They do drink water when it is available and sometimes they may even take a bath. California desert tortoises eat plants. They spend most of their time in burrows that they dig. These burrows protect them from the heat of the day which may reach well over 120 degrees Fahrenheit. The burrows also provide some relief from freezing temperatures in winter.

California Desert Tortoise

(Fold)



The kangaroo rat has a small body with large hind legs and feet. These help the kangaroo rat jump in loose, soft sand. The kangaroo rat's tail is longer than its body. This long tail helps the kangaroo rat balance as it makes long hops or jumps. Kangaroo rats can survive with very little water. Kangaroo rats that live in the desert can survive with no free water at all. They can make water from the dry seeds they eat. They don't sweat or pant. They spend their days in burrows where the air is more moist and humid than outside.

Kangaroo Rat

(Fold)



The hind legs of the antelope jackrabbit are longer than its front legs. This helps it leap and run. Its speed helps the antelope jackrabbit avoid predators. The antelope jackrabbit has big ears that are used to hear and to reduce body heat. Its ears help the antelope jackrabbit survive when the desert gets hot. The antelope jackrabbit searches for food mainly in the evening and early morning when it is cooler. They eat plants, including cacti, grass, and mesquite. Antelope jackrabbits rarely drink water. They get most of the moisture they need from the plants they eat.

Antelope Jackrabbit

(Fold)



The creosote bush is an evergreen shrub. It has small, dark green leaves, and flowers with five yellow petals. The plant has an odor of creosote—an oily liquid from coal tar often used for preserving wood. Mature creosote bushes can tolerate extreme drought and have a long life, sometimes living for over one hundred years. The small leaves of the creosote bush have a waxy coating which helps retain water. Some of the leaves drop off at the beginning of summer. Millipedes, beetles, kangaroo rats, and other small desert creatures live in the fallen leaves under the canopy of the creosote bush. The tap root of the creosote bush reaches down into the groundwater to get moisture. Some creosote bushes grow to a height of 15 feet. People have sometimes used parts of the creosote bush for medicines.

Creosote Bush

(Fold)

